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SUPPLEMENT 68

Diseases of Vegetable and Field Crops (Other than Cereals)

In the United States in 1928

May 1, 1929

BUREAU OF PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

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DISEASES OF VEGETABLE AND FIELD CROPS (OTHER THAN CEREALS)

IN THE UNITED STATES IN 1928

Prepared by B. F. Dana, Collaborator,
Plant Disease Survey, and Pathologist,
Texas Agricultural Experiment Station,
Substation No. 5, Temple, Texas.

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INTRODUCTION

For several years past, the writer, as a collaborator with the Plant Disease Survey, has been concerned in the preparation of a number of annual state reports. At times, the preparation of these has seemed somewhat burdensome but when once compiled and especially when accumulated over a series of years, these reports have proved valuable in many ways.

The compilation of the state reports into an annual summary is valuable mainly in proportion to the amount and completeness of the data available. This summary appears to be less complete than those of former years for the reason that fewer state reports seem to be available. It is hoped that there will not be any lessening of interest on the part of the collaborators in this important project which is dependent upon successful state cooperation. Since it is not possible for one to do another's work in this mutually helpful disease reporting service, each of us should make our contributions as fully and as promptly as possible.

The state collaborators' reports make up the bulk of the present summary. In addition to these, material was also secured from the literature and from persons within the Bureau of Plant Industry.

In preparing this report, a number of items have impressed the writer:

1. It is very apparent that the loss from the potato virus diseases in recent years is only a fraction of that experienced six to ten years ago. The use of better seed supported by extensive investigations has been responsible for reduction in prevalence and severity of these diseases to an extent that makes this one of the most notable achievements in agriculture in recent years.

2. Sweet potato storage losses, as reported from the producing states, seem to be unnecessarily high and point out the need for improvements in handling the crop.

3. Yellow dwarf, a new disease of onions, has been found in the Middle West. The sudden advent of this disease shows that the time is not past when new diseases may be expected to appear.

4. The reports on non-parasitic diseases are not very frequent. The importance of this class of diseases demands that greater consideration be accorded to investigation and extension of information concerning them.

5. In connection with the use of resistant varieties, the suggestions occur, (1) that more attention could well be given to the dissemination of information on available resistant varieties and strains of tomatoes thereby reducing the present high loss; (2) that the cucurbit diseases offer a very important field for the development of resistance in the various members of the group; and (3) that the production of disease resistant varieties of such crops as tomato, cabbage and sugar cane constitute distinct accomplishments that point the way to still greater achievements in the control of plant diseases.

DISEASES OF POTATO

LATE BLIGHT, PHYTOPHTHORA INFESTANS (MONT.) D BY.

Late blight occurred in the Atlantic Coast States and those bordering the Great Lakes. Heavy losses are reported only from New York, Wisconsin, Michigan and New Hampshire. Within individual states the occurrence of the disease was not unusual.

The first reported occurrence in northern states was on June 22 from Long Island, New York. This is unusually early even for Long Island. Clinton (Connecticut) reported the disease as having been found on July 11, the earliest record for that state. An interesting report of occurrence in Western Canada is given by Bisby (1) who found it in Manitoba at Portage la Prairie, Otterburne, and Miami.

Losses from late blight as estimated by collaborators appear in the accompanying table. Chupp of New York reports the disease as causing more damage in the state than for four or five years. Clayton of New York also reports that the disease caused greater losses on Long Island than had occurred for the past thirty years. Losses of 50 per cent in certain localities were reported from Maryland and Michigan.

Table 2. Percentage losses from late blight of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
30	Massachusetts	4	Maryland
20	New York, Wisconsin	2	North Carolina, Michigan
15	Tennessee	1	Iowa
10	West Virginia	.75	New Jersey
8	Minnesota	Trace	Connecticut,
5	New Hampshire, Wisconsin		Virginia, North Carolina,
			Mississippi, Ohio,
			Washington

The origin of first infections has been mentioned in reports from the following collaborators:

Connecticut: On July 11 we found the late blight on the lower leaves in an Irish Cobbler potato field in Woodmont. It occurred only on the lower leaves of plants which were otherwise healthy. These leaves had all been in touch with the ground, showing that infection came from zoospores which had developed through the tubers, thus confirming my theory that this is the ordinary method of primary infection. (Clinton)

Potato - Late Blight

Maine: On July 25 to 26 a number of fields were examined in Washington County in eastern Maine. Not a trace of late blight was found except in one small seed plot, otherwise completely disease-free, planted with seed grown in central Maine in 1927 with late blight there causing severe injury generally. Source of seed seems to have been the determining factor in 1928, since even 400 feet distant from the infected piece there was no disease in native-grown seed though the plants were in the same stage of growth and apparently in the same cultural conditions. (Folsom)

Environmental factors are recognized as greatly influencing the occurrence of late blight. A number of collaborators noted that weather conditions were as favorable early in the season for severe infection but that the disease was checked by dry weather or was rendered less destructive due to temperatures too high for germination of the spores. Jehle of Maryland reported fog as a factor increasing the severity of the disease in certain areas.

Jersey Red Skin was reported again as resistant in Maryland. Reddisk (2) has reported 46 resistant hybrids resulting from crossing the resistant variety Ekishirazu with various other varieties. Some of these may prove commercially useful.

Recent literature: Pl. Dis. Reptr. 12: 43, 53, 66, 74-75, 94, 106, 118, 118, 125, 131.

1. Bisby, G. R., and I. L. Conners. Plant diseases new to Manitoba. Sci. Agr. 8: 456-458. Mar. 1928.

2. Reddick, D. Blight-resistant potatoes. Phytopath. 18: 483-502. June 1928.

EARLY BLIGHT, ALTERNARIA SOLANI (ELL. & MART.) JONES & GROUT

Early blight was reported as more or less general over the potato producing sections of the country. In most cases where it was present it did but little damage. The greatest loss reported in one field was from Missouri where 18 per cent loss occurred in one instance. The average for the State, however, was not over 1 per cent. New York and Michigan reported similar percentages for general losses. Two per cent loss, the highest in any state, was reported from Florida.

Early maturing varieties were reported to be more seriously affected than late varieties by several collaborators. This disease was reported to attack early varieties near the end of the growing season and in some cases to be the cause of premature death of the vines. In the Norfolk Section of Virginia, McWhorter reported it of great importance on the second crop but of minor importance on the first.

Potato - Early Blight

May 30 was the earliest reported occurrence in Georgia while July 5 was the earliest appearance reported in the Northeastern States.

Table 3. Percentage losses from early blight of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
2	Florida	Trace	Tennessee, New Jersey,
1.5	North Carolina		Indiana, Mississippi,
1	Missouri, New York, Michigan, Minnesota, Arizona		Colorado, Iowa, New Hampshire, West Virginia, Wisconsin, Arkansas,
.5	North Dakota, Maryland		Montana, Utah

SCAB, ACTINOMYCES SCABIES (THAX.) GUSSOW

Common scab was reported from all parts of the country as causing moderate losses in most cases. The most serious losses were reported from Massachussetts by W. H. Davis who stated that scab was found in every field and was especially severe in low places. He also reported 100 per cent loss of commercial grade in a single field since the crop had to be culled and fed to stock. R. A. Jehle of Maryland reported the amount of scab in the spring crop about the same as for 1927, but that less scab was found in the fall crop. McWhorter (Va.) has not observed much yearly variation in prevalence. L. O. Gratz from Florida reported scab of no consequence because of the reaction of the soil which ranged from pH 5.2 upwards. R. H. Porter of Iowa found scab to be serious in peat land which was known to be acid. Taubenhaus (Texas) reported it as very prevalent in the lower Rio Grande Valley. R. F. Crawford of New Mexico reported it present wherever potatoes were grown in the state attributing the prevalence to alkaline soils. Losses over the country ranged from a trace to a maximum of 6 per cent reported from Colorado.

Some interesting notes on varietal susceptibility were contributed by H. G. MacMillan (1) from observations in Nevada. He found Russet Burbank or Netted Gem free from scab, while the thin-skinned varieties were susceptible under the same conditions. Le Clerg (Colorado) reported Cobblers and Triumph more seriously affected than others.

Collaborators contributed some interesting notes on control. R. E. Vaughan (Wisconsin) reported hot formaldehyde and corrosive sublimate satisfactory but that "Semesan bel" and "Dip dust" were less effective. Mar-

tin (N. J.) reported satisfactory results with organic mercury dip treatment and acid fertilizers. T. Dykstra (Oregon) reported that crop rotation and seed treatment were effective control measures in that state. Investigations on control were carried on at various places. Moore and Wheeler (2) reported interesting results in a comparison of corrosive sublimate and organic mercury compounds for both scab and Rhizoctonia.

Recent literature

1. MacMillan, H. H. The V & F Pathologist 1 (20): 78. Oct. 1, 1928.

2. Moore, H. C. and E. J. Wheeler. Seed potato disease controls compared. Michigan Agr. Sta. Quart. Bul. 10 (4): 163-165. 1928.

BLACKLEG, BACILLUS PHYTOPHTHORUS APPEL

Table 4. Percentage losses from blackleg of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
15	South Dakota	1	West Virginia, New Hampshire,
10	Iowa		Michigan, Minnesota,
5	Colorado		Washington
3	Kansas, Oregon	.5	Maryland, Arizona, Utah
2.5	North Dakota	Trace	New Jersey,
2	Montana, North Carolina, Missouri		New York, Georgia, Florida, Mississippi, Arkansas, Ohio,
1.5	Virginia		Indiana, Wisconsin

Blackleg was reported from each of the major potato sections in most cases causing minimum losses. Chupp (New York) reported it as causing 1 per cent loss on Long Island whereas for the rest of the State there was only a trace. Archer (West Virginia) found it particularly serious on early Irish Cobblers. In Arkansas it was more destructive than at any time during the previous ten years. (Rosen). Tilford (Ohio) mentioned rains as favoring the disease. Vaughan (Wisconsin) gave the highest estimate of maximum losses which reached 50 per cent in a few fields. Porter (Iowa) noted blackleg particularly prevalent in home gardens. Streets (Arizona) reported it decreasing with the use of better seed.

The relation of certified seed to the prevalance of disease was mentioned by several collaborators. Crops from certified seed in more than one instance contained little or none of the disease while considerable quantities occurred in common or non-certified stocks.

Potato - Blackleg

Vaughan (Wisconsin) reported marked control in one case by seed treatment.

Literature during the year has contained an important contribution from Bonde (1) on the relation of seed corn maggot to the spread of the trouble.

Recent literature: Pl. Dis. Reptr. 12: 23, 35-36, 75, 132.

1. Bonde, R. The transmission of potato blackleg by the seed corn maggot in Maine. Phytopath. 18: 459. May 1928.

RHIZOCTONIA, CORTICIUM VAGUM BERK. & CURT. (RHIZOCTONIA SOLANI KÜHN)

The Rhizoctonia disease was reported from all sections of the country, principally as a stem rot trouble. In many sections it was prevalent in practically every field without noticeable damage. Severe stem lesions accompanied by aerial tubers were reported from Wisconsin and Florida. The aerial tubers, however, were found only after the stems were practically girdled. It is interesting to note from reports that the severest, general occurrence of Rhizoctonia was in states where potatoes are grown under irrigation. The alkaline reaction of some of the soils in these areas seems to favor the parasite. Streets of Arizona found Rhizoctonia causing loss in 400 acres when treated, certified Nebraska seed was planted on new land. This would indicate the indigenous occurrence of the fungus in such soils. MacMillan reported Rhizoctonia to be the most destructive potato disease in Nevada. Le Clerg (Colorado) reported it most prevalent at high altitudes.

Table 5. Percentage losses from Rhizoctonia of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
12	California	3	Utah, North Dakota, New Jersey, Colorado
10-25	Oregon		
8	Arizona	2	Missouri, Iowa, Minnesota, North Carolina.
7	Kansas		
5	New York	1	Wisconsin, Michigan, Massachusetts
4	Maryland		
		Trace	Ohio, Tennessee

Brentzel (North Dakota) mentioned an increase of Rhizoctonia due to wet weather. Dykstra (Oregon) also reported it as severe only under irrigation or where moisture supplies were abundant. Minnesota reported increase of Rhizoctonia due to use of peat land and lack of rotations.

Potato - Rhizoctonia

Conflicting reports have been received on the effectiveness of control measures. Kotila (1) of Michigan has secured effective control with corrosive sublimate and has also tested organic mercury compounds which he finds not superior to the standard corrosive sublimate treatment. MacMillan (2) reports seed treatment ineffective in control. Young (Montana) reports Rhizoctonia equally prevalent in fields grown from treated and untreated seed. Martin (New Jersey) reported favorably on organic mercury treatment.

Recant literature: Pl. Dis. Repr. 12: 23.

1. Kotila, J.E. Black scurf of potatoes is controlled by corrosive sublimate. Michigan Agr. Sta. Quart. Bul. 10 (4): 184-186. 1928.

2. MacMillan, H. G. The V&F Pathologist 1 (20): 80. Oct. 1, 1928.

3. Martin, W. H. Efficiency of organic mercury compounds in potato seed treatment. Proc. Ohio Veg. Grow. Assoc. 13: 19-23. 1928.

4. Stallings, J. H. Result of some seed potato treatments. Test shows effect on germination and yield. Florida Grow. 36: 30-31. June 1928.

5. Moore, H. C.,and E. J. Wheeler. Seed treatment experiment in Michigan. Amer. Potato Jour. 5 (4): 100-103. 1928.

6. Orton, C. R., and G. F. Miles. Seed potato treatments in 1927. Amer. Potato Jour. 5 (5): 131-136. 1928.

WILT, FUSARIUM OXYSPORUM SCHL.

The status of the occurrence of Fusarium wilt in the United States for 1928 can be gauged from the following quotations:

New York: This disease seems to have disappeared almost entirely from the state. The inspectors state that they did not see one-half dozen affected hills all summer. (Chupp)

West Virginia: This year a scattered infection occurred and doubtlessly was traceable to seed infection. (Archer)

Missouri: Seems to be largely confined to tuber injury. So far very slight damage (wilting) has been found and reported on plants in field. (Scott)

Potato - Wilt

Utah: Reported from the warmer counties where the dry season and scarcity of irrigation water were favorable for the disease. (Richards)

Nevada: Usually follows older culture. The whole seed was showing better returns, as might be expected, and indicated that soil infection of the cut seed was the origin of the Fusarium trouble. (MacMillan)

Losses where the disease occurred ranged from a trace to as much as 4 per cent. It is very evident that the disease is not a great factor in potato production.

Weiss, Lauritzen and Brierley (2) have published a paper during the year on the factors influencing the occurrence of Fusarium rot in stored potatoes. Varietal susceptibility is the subject of a paper by Goss (1) of Nebraska.

Recent literature

1. Goss, R. W. Varietal susceptibility of potatoes to Fusarium wilt and stem end rot. Phytopath. 18: 307-309. Mar.1928.

2. Weiss, Freeman, J. I. Lauritzen, and Philip Brierley. Factors in the inception and development of Fusarium rot in stored potatoes. U. S. Dept. Agr. Techn. Bul. 62: 35 p. May 1928.

BACTERIAL WILT, BACTERIUM SOLANACEARUM EFS.

Bacterial wilt of potatoes was reported from only a few states and in every case a trace only of the disease was found. North Carolina, Georgia, Florida and Mississippi were the only states reporting its presence.

VIRUS DISEASES

Virus diseases were generally prevalent in 1928. In general large losses from virus diseases are confined to fields planted with non-certified or common seed stocks. The general recognition of these diseases by the best seed growers has also done much to eliminate former excessive losses. It is noticeable that those sections using better seed report less loss than other sections in which the use of certified seed is not common. The following virus diseases were recognized and reported by collaborators and others.

Potato - Virus Diseases

1.	Mild mosaic	Psyllid yellows*
	Rugose mosaic	Yellow dwarf*
	Leaf roll	Witches' broom
	(a) Net necrosis	Apical leaf roll
	Spindle tuber	

Recent literature: Pl. Dis. Reptr. 12: 23, 132.

1. Hadfield, J. W., and J. H. Claridge. Certification of seed potatoes. New Zealand Jour. Agric. 37: 8-18. 1928. (Abstract Rev. Appl. Myc. 7: 801. Dec. 1928)

2. Thung, T. H. Over knolentingen, die ter bestudeering der virus-ziekten van de aardappelplant worden uitgevoerd. (On tuber grafts carried out for the study of the virus diseases of the potato plant.) Tijdschr. over Plantenziekten, 34 (7): 195-199. 1928. (French summary). (Abstract Rev. Appl. Myc. 7: 801. Dec. 1928)

3. Tucker, J. Canadian certified seed potatoes. Rules and regulations governing their production. Canada Dept. Agric. Pamphlet 84, N.S. 11 pp. 1927. (Abstract Rev. Appl. Myc. 7: 533. Aug. 1928.)

4. Band, P. Over invloed van de grondsoort op het pootgoed bij aardappelen. (On the influence of the type of soil on seed potatoes.) Tijdschr. over Plantenziekten 34 (4): 147-153. 1928.

5. Davidson, W. D. A review of literature dealing with the degeneration of varieties of the potato. Econ. Proc. Roy. Dublin Soc. 2: 331-389. June 1928.

6. Gilbert, A. F. Net necrosis of Irish potato tubers. Vermont Agr. Exp. Sta. Bul 289, 36 pp. Sept. 1928.

7. _____ Production of potato tuber necrosis. Science n.s. 57 (1740): 464-465. 1928.

8. Goss, R. W. Transmission of potato spindle tuber by grasshoppers (Locustidae). Phytopath. 18 (5): 445-448. 1928.

9. Schander, R. and Bielert. Nekrose und andere Degenerationserscheinungen im Phloem der Kartoffelpflanze. (Necrosis and other degeneration phenomena in the phloem of the potato plant.) Arb. Biol. Reichsanst. fur Land.-und Forstwirtsch. 15 (5): 609-670. 1928.

10. Smith, J. H. The transmission of potato mosaic to tomato. Ann. Appl. Biol. 15: 517-528. Nov. 1928.

* Included here although there is some question as to the true nature of the troubles.

MILD MOSAIC (VIRUS)

Mild mosaic appears to be prevalent wherever potatoes are grown although in many cases the symptoms are masked by high temperatures and droughty conditions. Traces of the disease were reported from the following states: Massachusetts, New Jersey, Virginia, North Carolina, West Virginia, Florida, Texas, Minnesota, North Dakota, Kansas, Montana, Arizona, Utah, Colorado and Oregon. Sup rior roguing methods used by seed growers have lowered prevalence in certified seed. Reports of the value of certified seed and the influence of environment were made from the following states:

Maryland: Use of certified seed has greatly reduced the losses from this disease. (Jehle)

West Virginia: Affected plants were reported rather frequently even in fields planted with certified seed. (Archer)

Florida: Loss practically negligible. (Gratz)

Texas: Seventy-five per cent in some fields in Hidalgo and Cameron Counties affected. (Taubenhaus and Bach)

Iowa: Cloudy days and cool, rainy weather developed mosaic more than is common in Iowa. Not so much masking as usual. (Porter)

Varietal susceptibility was mentioned in reports from Wisconsin and Oregon.

Wisconsin: Present in varying amounts especially on Triumph, Cobbler, and Green Mountain varieties. Rarely found on Ohio and Rural. (Vaughan)

Arizona: Estimated loss 1 per cent. (Streets)

Oregon: The temperature was quite low this summer and therefore favorable for the expression of the symptoms. Irish Cobbler appears to be immune. Controlled by rigid roguing. (Dykstra)

The use of indexing tubers as a means of eliminating mild mosaic was reported from Wisconsin where 200 bushels of seed of the Triumph variety were indexed for Wisconsin growers from which 4,000 bushels of seed stock were grown.

RUGOSE MOSAIC (VIRUS)

Rugose mosaic is more easily recognized than mild mosaic and was reported generally from all sections of the country. Traces only were reported from most states with New Jersey and New York estimating the highest losses of 3 and 5 per cent respectively.

A note on varietal susceptibility was contributed from Oregon: "The disease spreads more rapidly in varieties like Garnet Chili, and Bliss Triumph than in Burbank and Netted Gem and it appears that there is a difference in the degree of susceptibility among different varieties." (Dykstra). In Minnesota mild mosaic affected only Triumph and Green Mountains.

The value of certified seed and varietal selection was reported from Maryland, New Jersey, and Iowa.

New Jersey: Found only in fields planted with non-certified seed. (Martin)

Maryland: Field losses were reduced by use of certified seed and the Jersey Redskin variety, and further lessened by the decreased use of the McCormick variety. However, these gains in the field were somewhat offset by an increased amount of mosaic in the Cobbler seed potatoes. (Jehle)

Iowa: Rugose mosaic is seldom seen in Iowa but this year it could be found in many fields especially those planted with uncertified seed. (Porter)

The use of the seed plot with the tuber unit method of planting and severe roguing during season as a means of eliminating rugose mosaic in foundation stocks was reported from Oregon.

LEAF ROLL (VIRUS)

The story of leaf roll occurrence is similar to that of mild and rugose mosaic. This disease is fast becoming eliminated from better seed stocks. The reports of excessive losses are in most cases from non-certified or common seed used in garden plantings. New York reported the highest loss, 10 per cent, New Jersey 8 per cent, Arizona 6 per cent, Maryland 2 per cent, and Utah 1 per cent.

The relation of net necrosis to leaf roll was reported by Gilbert (1 and 2).

Potato - Leaf Roll

Recent literature: Pl. Dis. Reptr. 12: 23, 75, 132.

1. Gilbert, G. H. Net necrosis of Irish potato tubers, Vermont Agr. Exp. Sta. Bul. 298: 1-36. Sept. 1928.

2. Gilbert, G. H. Net Necrosis of Irish potato tubers. (Abstract) Phytopath. 19: 82 Jan. 1929.

SPINDLE TUBER (VIRUS)

The occurrence and losses from spindle tuber are noted in the following table:

Table 6. Percentage losses from spindle tuber of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
2	Kansas	Trace	New York, Florida, Mississippi, Nebraska, Montana, Nevada, Oregon
1-2	California		
1.5	New Jersey		

Distribution of spindle tuber within the states seems to be erratic as can be seen in the following quotations from collaborators:

New York: Small loss on Long Island, not important in any other section of the state. Cobbler seed now much more nearly free than in past years. (Chupp)

Montana: Seen in small amounts in many fields of Netted Gem potatoes in western edge of state. (P. A. Young)

California: Found in Delta region near Stockton and around Porterville. (Kendrick)

Oregon: Found this year in western Oregon in one field. The original seed stock came from one of the neighboring states. This is the first time that this disease has been encountered in commercial fields in western Oregon. It has been found only a few times and in small amounts in eastern Oregon in stocks recently brought in from the outside. (McKay & Dykstra)

Transmission of spindle tuber has been secured experimentally by Goss (1) and was mentioned incidentally by MacMillan (2).

Potato - Spindle Tuber

Recent literature: Pl. Dis. Reptr. 12: 132.

1. Goss, R. W. Transmission of potato spindle tuber by grasshopper (Locustidae). Phytopath. 18: 445-448. May 1928.

2. MacMillan, H. G. The V & F Pathologist 1 (20): 80. Oct. 1, 1928.

PSYLLID YELLOWS (CAUSE UNDETERMINED)

Psyllid yellows appears to be largely confined to Utah and adjacent states, although in 1928 it was also reported from California. This disease has been definitely determined by Richards to be transmitted by the potato psyllid, Paratrioza cockerelli Sulc. Its severity seems to depend very largely on the prevalence of these insects in the potato fields. Since this disease has been recognized only recently the reports by pathologists in affected regions will be of interest.

Utah: Losses from psyllid-yellows in Utah were greatly reduced over those experienced in 1927. While the potato psylla this year was almost coextensive with potato culture in the state, the damage was but slight in most of the areas where in 1927 it was disastrous. The total loss for 1928 would probably not exceed 7 per cent, while in 1927 the decrease in yield from psyllid yellows ranged between 25 and 30 per cent. This decreased loss was undoubtedly due to the fewer number of insects present in the various areas.

Damage to the potato crop during the year varied greatly in the different districts within the state. In Washington County the destruction, as in 1927, was complete. The entire crop planted between February 15 and March 10 was plowed up, except for 2 experimental plots, by June 10.

Davis and Weber Counties, wherein the loss in 1927 amounted to 75 per cent of the crop, suffered between 10 and 12 per cent loss during the past season. In the survey of Hunter and Magna districts of Salt Lake County, made during August, 72 per cent of the fields showed yellows with an average of 16 per cent of the plant s affected. An average of 9.5 per cent of plants in all the fields visited showed the trouble.

Some loss occurred in other potato-growing areas although there exists but little data to indicate the approximate amount. In Cache County the losses were felt in the early garden crop which was largely destroyed, and in the late commercial plantings. Sanpete and Sevier Counties are reported to have suffered severely.

Interest lies in the fact that the potato psylla overwintered throughout its entire 1927 range. In Washington County, in the extreme southwest part of the state, psyllids were first noted in serious numbers

by May 10. However, judging from the stage of disease at this date, the insect had evidently appeared as early as March 15. Psyllids were found throughout Salt Lake, Davis, Weber, and Boxelder Counties on volunteer potato plants as early as June 12 to 15. Here again the stage of progress of the disease indicated their appearance on potatoes from 10 to 15 days earlier than these dates. On the Station experimental plats at Logan, in the extreme northern part of Utah, psyllids in the nymph stage were collected from the matrimony vine on May 14.

The progress of the disease, in certain localities, and its relation to the tomato psyllid (Paratrioza cockerelli Sulc.), was identical with the development in 1927. (B. L. Richards)

Idaho: We have not noted this disease in Idaho this year. Personally, I have been over the potato-growing regions of southern Idaho several times. (Hungerford)

Colorado: The psyllid yellows was first seen in Colorado in 1926 about June 18 on the early potato crop and caused a loss of two-thirds of the early crop in the Fruita district. In the same district in 1927 the disease was more severe and was also found in Delta, Montrose, and Garfield Counties. The disease was not reported in fields above 6,000 feet. In 1928 the disease was not as prevalent as in the two previous years although as much as ten per cent of the acreage of early potatoes was plowed up and replanted to other crops, the remaining plantings showing infestations of 0 to 10 per cent. (From a special report by C. H. Metzger, Assist. in Hort. and A. M. Binklay, Assoc. Hort. Colorado Agricultural College.)

California: The serious potato disease reported and named by Dr. Richards and his co-workers as "PSYLLID YELLOWS" has recently been discovered in Southern California. The first specimens of this kind were brought to the writer early in December from the Lake Elsinore district in Riverside County. This district was visited a few days later and the entire fall crop of potatoes in that area appeared to be severely affected. The symptoms in every detail closely corresponded with those formerly described on potatoes in Utah. Yellowing, rolling and purpling of the leaves was quite pronounced. The growth ceased, the internodes were shortened and the tuberization was well marked at the nodes and at the apexes. The latter had also a rosette appearance. The psyllid adults and nymphs were abundant. The infection evidently took place before the tubers were formed since not many tubers larger than walnuts could be found. The owners were plowing the fields under without attempting to dig.

In this connection it is interesting to recall that the early spring crop of 1926 in the coastal section of northern San Diego County was a complete failure on account of a disease characterized by all the peculiar symptoms now attributed to the psyllid infection, but at that time the disease was not properly identified. White Rose and, in part, British Queen are practically the only varieties grown in these sections.

Potato - Psyllid Yellows

The tomato psyllid (Paratrioza cockerelli Sulc.) has been very abundant in Southern California this season, and damage to tomatoes and peppers was likewise reported, but it has not been possible to ascertain how much of this damage is due to a possible virus carried by these insects and how much to the injury caused by their feeding. (Shapovalov)

References: Pl. Dis. Reptr. 12: 21, 43.

YELLOW DWARF (CAUSE UNDETERMINED)

Yellow dwarf was reported only from New York State where traces were found in a few fields.

WITCHES' BROOM (VIRUS)

The disease was reported from Michigan, Minnesota, Montana, Washington, and Oregon. In one Montana field, of one-half acre, however, 3 per cent was found and tuber indexing work also revealed the disease in selected seed stocks. In general it caused only slight loss.

APICAL LEAF ROLL

Apical leaf roll, a new disease of the leafroll group, which can be transmitted by tuber grafts has been described by Schultz and Bond4 (1) in Maine.

Recent literature

1. Schultz, E. S., and Reiner Bonde. Apical leaf roll of potato. (Abstract) Phytopath. 19: 82. Jan. 1929.

TIPBURN

Special comments by collaborators were as follows:

New York: Statewide occurrence was reported with a total loss of about 7 per cent. Rains first part of season delayed appearance of severe tipburn. The earliest occurrence reported was on July 20. Rurals were resistant; Cobblers and Bliss Triumphs very susceptible. Loss in an average field often reached 25 per cent. (Chupp)

Potato - Tipburn

Mississippi: While localized in occurrence tipburn was very severe. The earliest date of appearance noted was May 5. (Neal, Wedgworth, & Miles)

New Mexico: One of the most important potato troubles in the State. (Crawford)

HOPPERBURN

Hopperburn which may in some cases be confused with tipburn was reported from many states. The distribution and severity is noted in the following table. In addition to the states mentioned in the table the disease was reported as severe in Mississippi, Ohio, and New Mexico.

Table 7. Percentage losses from hopperburn of potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
30	Arkansas	1	Missouri, Minnesota
7	New York	.5	Maryland
5.5	New Jersey	Trace	North Carolina, Massachusetts, Tennessee, Florida, Louisiana, Michigan, Iowa, Kansas
5	West Virginia		
2	Wisconsin, Indiana		

Special notes on occurrence were contributed by collaborators.

New Jersey: Good control followed spraying with Bordeaux mixture (5-7-50) made with hydrated lime. (Martin)

Delaware: More than last year. Satisfactory control with 3-5 sprayings with Bordeaux. (Adams)

Maryland: Very destructive on some unsprayed fields this year. (Jehle)

West Virginia: During July hopperburn was general and rather severe on unsprayed fields. In commercial fields the regular spray schedules controlled the trouble efficiently. (Archer)

Arkansas: Irish Cobbler resistant; Bliss Triumph very susceptible. The most common and the most destructive disease on Irish potatoes in the state. (Rosen)

Potato - Hopperburn

Ohio: September 1. Due to extremely dry and hot weather, hopperburn has developed in severe form during the last three weeks. Fields that have not been sprayed or dusted are practically dead. (Tilford)

Wisconsin: Earliest occurrence August 1. Early varieties very susceptible. (Vaughan)

Iowa: Somewhat delayed this year although common on Triumphs and Ohios. Cool nights held trouble in check and with abundant June and July rains favored development of crop. (Porter)

MISCELLANEOUS PARASITIC DISEASES

Disease	Cause	State reporting	Remarks
Eelworm	Caconema radicicola (Greef)Cobb	Nevada	Serious in Newlands Project
		Florida	Common on Bliss variety in certain types of soil usually late in spring. (Weber)
		Mississippi, Texas, Arizona	Earliest appearance June 7.
Silvery scurf	Spondylocladium atrovirens	New York, New Jersey, Washington	Traces
Slime mold	Stemonites splendens	Florida	Found in few fields; not parasitic; no damage. (Weber)
Wilt	Verticillium albo-atrum	Utah	General, causing 1 per cent loss.
		Oregon	Appears to be much less prevalent in western Oregon than was true a few years ago. (McKay)
		Massachusetts, Colorado	Trace
Root rot	Phymatotrichum omnivorum	Texas	Restricted to South Texas.
Stem rot	Sclerotium rolfsii	Texas	

Potato - Parasitic Diseases

Recent literature

1. Brierley, P. Pathogenicity of Bacillus mesentericus, B. aroideae, B. carotovorus, and B. phytophthorus to potato tubers. Phytopath. 18: 819-838. Oct. 1928.

2. Burr, S. Sprain or internal rust spot of potato. Ann. Appl. Biol. 15: 563-585. Nov. 1928.

3. Bryan, H. Wart disease infection tests. Jour. Agr. Sci. 18: 507-514. July 1928.

4. Drechsler, Charles. A diplanotic species of Phytophthora causing pink rot of potato tubers. (Abstract) Phytopath. 19: 92. Jan. 1929.

5. Ducoment, V., and Foex, Et. Essais effectuées en 1927 au champ d'expériences établi par l'Institut des recherches agronomiques à Russ-Hersbach (Bas-Rhin) en vue de l'étude de la maladie verruqueuse (Synchytrium endobioticum (Schilb.) Perc.) de la pomme de terre. Compt. Rend. Acad. Agr. France 14: 442-445. Mar. 14, 1928.

6. Esmarch, F. Untersuchungen zur Biologie des Kartoffelkrebses. III. (Investigations on the biology of potato ward.) Angew. Bot. 10(3): 280-304. 1928. (Abstract Rev. Appl. Myc. 7: 738. Nov. 1928).

7. Hodson, W. E. H., and Gibson, G. W. Some experiments with calcium cyanide as a control for plant parasitic nematodes. Ann. App. Biol. 15: 639-648. 1928.

8. Kingma, F. H., and Thoe, Van Beijma. Ueber ein Kartoffelfaüle verursachendes Verticillium, Verticillium foexii nov. spec. Med. Phyt. Lab. Willie Commelin Sch. 12: 31-35. Sept. 1928.

9. Müller, K. O., Ueber den "echten mehltau" der kartoffel. Nachrichtenbl. Deut. Pflanzenschutzd. 8: 19-20. Mar. 1928. (Abstract Rev. Appl. Myc. 7: 534. 1928).

10. Noble, R. J. Root knot and other eelworm diseases. Agr. Gaz. New South Wales 39: 546-550. July 1928.

11. Quanjer, H. M. Een aaltjesziekte van de aardappelplant... (An eelworm disease of the potato plant, the mode of infection and the source of its cause, Tylenchus dipsaci Kühn.) Tijdschr. Plantenz 33: 137-172. 1927.

12. Reiling: Kringelsucht der Kartoffel. (Sprain of potatoes) Illus. Landw. Zeit., 48 (9): 121. 1928. (Abs. Rev. Appl. Myc. 7: 597. Sept. 1928)

13. Roach, W. A., and M. D. Glynne. The toxicity of certain sulphur compounds to Synchytrium endobioticum, the fungus causing wart disease of potatoes. Ann. Appl. Biol. 15: 168-190. May 1928.

14. Schlumberger, O. Krankheiten und ihre Bekämpfung. In Versuchsergebnisse auf dem Gesamtgebiete des Kartoffelbaus in den Jahren 1923-1926. Mitt. Biol. Reichsanst. Land. u Forstwirtsch. 36: 102-113, Jan. 1928.

15. Weiss, F., and P. Brierley. Factors of spread and repression in potato wart. U. S. Dept. Agr. Bul. 56: pp. 14. 1928.

MISCELLANEOUS NON-PARASITIC DISEASES

The following miscellaneous non-parasitic diseases were reported from the states indicated.

Disease	State reporting	Remarks
Black heart	New York, Washington	Small amounts reported
Fertilizer injury	New York	High analysis fertilizer placed in row too near seed.
Frost injury	New York	Small, mottled, distorted leaves and stunted plants.
Drought injury	New York	Reduced yield
Hail injury	New York	Observed in three fields.
Hollow heart	Wisconsin, Washington	Associated with over-development at end of season.
Internal brown spots	Washington	Associated with light soils and irregular moisture.
Lightning injury	New York	Two cases observed
Pitting	Washington	Sub-oxidation
Poor Germination	Kentucky, New York	Excessive moisture at time of planting and unfavorable storage of seed

Potato - Parasitic Diseases

Disease	State reporting	Remarks
Sprout tubers	Kentucky	Tubers formed directly from seed piece with no top growth.
Walnut injury	New York	Observed in two counties

Recent literature

1. Gericke, S. Die Erforschung der Urbarmachungskrankheit. Die Umschau 32: 278-279. Mar. 31, 1928.

Also called Heidemoorkrankheit. A disease affecting almost all cultivated crops in Holland and Germany on newly cleared land. Similar disease apparently to trouble affecting crops on muck land in U. S. Control in this case was obtained by broadcasting copper sulfate crystals.

2. Moore, H. C. Further studies of potato hollow heart. Proper cultural practices lessen percentage of tubers affected. Michigan Agr. Exp. Sta. Quart. Bul. 11: 20-24. Aug. 1928.

DISEASES OF TOMATO

FUSARIUM WILT CAUSED BY FUSARIUM LYCOPERSICI SACC.

Wilt was reported as serious only in certain southern and central states. Destructiveness in northern states appears to be confined largely to greenhouse-grown tomatoes. Damage in Mississippi was reported to be greatly lessened by the use of wilt-free seed. (Neal, Wedgeworth, Miles). Louisiana Pink and Louisiana Red were reported to be resistant in Louisiana (Tims). All varieties yet tested seemed to be more or less susceptible at the Virginia Truck Station. (McWhorter). Marvel, Marvelosa, and Marglobe were reported to be resistant in Missouri but resistance was expressed in delay of infection. (Scott). Resistant varieties are reported to have given favorable results in New Mexico (Crawford). Wilt in Marglobe, a resistant variety, was just as severe on new land as on land previously cropped to tomatoes in the lower Rio Grande Valley of Texas (Bach).

Losses from the disease are given in the accompanying table. It was also reported as severe or general in Florida, Louisiana, Arkansas, and New Mexico.

Table 8. Percentage losses from Fusarium wilt of tomato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
30	Texas	4	New Jersey, North Carolina
15	Arkansas	3	Kansas
12	Louisiana	2	Maryland, Ohio, Utah
10	Tennessee, Florida, Mississippi	Trace	New York, West Virginia, Indiana, Wisconsin,
9	Arizona		Iowa, Texas?, Nebraska,
5	Georgia, Missouri, Virginia, Texas?		Washington, California, Michigan

Recent literature: Pl. Dis. Reptr. 12: 22, 118, 133.

1. Haymaker, H. H. Relation of toxic excretory products from two strains of Fusarium lycopersici Sacc. to tomato wilt. Jour. Agr. Res. 36: 697-719. Apr. 15, 1928.

2. Haymaker, H. H. Pathogenicity of two strains of the tomato-wilt fungus, Fusarium lycopersici Sacc.-- Jour. Agri. Res. 36: 675-695. 1928.

LEAF SPOT, SEPTORIA LYCOPERSICI SPEG.

The distribution and importance of leaf spot is shown by the following table. In addition, Pennsylvania and Ohio reported severe infections but gave no estimates. The time of appearance and behavior is shown by reports from several collaborators.

West Virginia: The Septoria leaf spot is the most severe disease of the tomato in West Virginia. It occurred widely and by September 1 practically all plants had lost half their leaves. In many cases the vines were killed outright. The larger commercial growers suffer little loss because they expect to harvest only a few crops before the spring market is flooded and the price drops. The infection usually comes after the larger growers have completed their harvest. The smaller growers, however, who maintain wayside markets and the home gardener suffer considerable loss. (Archer)

Delaware: Weather favorable for late infection but yield not reduced as much as last year. (Adams)

Tomato - Leaf Spot

Georgia: Ordinarily becomes noticeable during the last of the early crop (July) and is most severe on the following or late summer crop planted out in July. Was held in check on one farm by spraying. (Boyd)

Ohio: Caused rather severe losses in a large number of fields in Ohio this year, even where spray programs were used, due probably to the late start in spraying. (J. D. Wilson)

Indiana: Worst it has been in ten years. Loss for state carefully estimated for early Septonia is 8.7 per cent or a money value of $171,000. (Gardner and Brown)

Table 9. Percentage losses from leaf spot of tomato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
15	West Virginia	3	Texas, Virginia, Iowa
10	Kansas	2.5	North Carolina
8.7	Indiana	1	New York, Michigan, Arkansas
8.	Utah		
7	New Jersey	0	Pennsylvania
5	Maryland, Iowa, Tennessee	Trace	Georgia, Mississippi, Nebraska, New Mexico, Minnesota
4	Wisconsin, Missouri		

EARLY BLIGHT, ALTERNARIA SOLANI (ELL. & MART.) JONES & GROUT

The occurrence of early blight in severe form as shown by the table was not general. In addition to the states named general occurrence or severe infection was reported from Connecticut, Massachusetts, Florida, and Mississippi. Nearly every case of severe infection was reported to have followed wet weather and several collaborators stressed the importance of this climatic factor.

In Delaware the organism caused much damage as a stem or collar blight. Some plants were killed outright and many others were stunted.

Table 10. Percentage losses from early blight of tomato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
15	Maryland	3	Ohio
10	Massachusetts, Louisiana	2	Indiana
		1.5	North Carolina
8	Virginia	1	New Jersey, Florida, Arkansas
5	Missouri, Tennessee, Mississippi	Trace	Delaware, West Virginia, Wisconsin, Iowa, Minnesota, Montana
4	Georgia		

References: Pl. Dis. Reptr. 12: 21, 66.

CURLY TOP (WESTERN YELLOW BLIGHT)

This disease, formerly known as western yellow blight, later as yellows (4), but now spoken of by most western workers as curly top, was reported as severe only in certain localities. The prevalence of this disease appears to depend entirely upon the occurrence of the beet leaf hopper (Eutettix tenellus), the disseminating agent, and for this reason the factors influencing the insect are very important. Severe localized infection was reported from Mesilla Valley, New Mexico (Crawford); Arizona 25 per cent loss (Streets); southern Utah 7 per cent loss (Richards); and eastern Oregon (Dykstra). Washington reported 15 per cent loss and California ten per cent loss.

Concerning the disease in Utah, Richards reports: Yellows (curly top) was found in 15 of the 17 fields visited. The maximum infestation observed in any one field was 81 per cent. Six of the 15 fields ranged above 50 per cent, with a total average for the diseased fields of 44.3 per cent. Yellows is the most serious disease of the tomato in the Hunter and Magna districts, although in 1927 canker ranked about equal in destructiveness.

Recent literature: Pl. Dis. Reptr. 12: 22, 97, 108, 118.

1. McKay, M. B. The curly top disease. Seed World 23 (13): 38, 40, 72, June 29, 1928.

2. Severin, H. H. P. Transmission of tomato yellows or curly top of the sugar beet by Eutettix tenellus (Baker). Hilgardia 3: 251-271. May 1928.

3. _____ Tomato yellows or tomato curly top. Phytopath. 18: 709-710. Aug. 1928.

4. Shapovalov, M. Yellows, a serious disease of tomatoes. U. S. Dept. Agr. Misc. Publ. 13, 4 p. Feb. 1928.

LEAF MOLD, CLADOSPORIUM FULVUM CKE.

Leaf mold was reported in traces from the southern states where it is troublesome as a field disease. The really serious occurrences were reported from greenhouses in the northern states. It is not uncommon for a large proportion of foliage to be destroyed indirectly affecting fruit production and causing heavy losses. Estimated losses in greenhouses are Oregon 20 per cent, Michigan and Wisconsin 5 per cent, and Massachusetts 3 per cent.

A variety resistant to leaf mold was reported to be under trial in Oregon (McKay). Newhall and Wilson (3) have reported on the introduction of forced-air ventilation systems in greenhouses for control of this disease.

Recent literature: Pl. Dis. Reptr. 12: 22, 70, 133, 146.

1. Gregory, C. T. Controlling tomato leaf mold in greenhouses in Indiana. Proc. Indiana Acad. Sci. 37: 382-385. 1927.

2. Newhall, A. G. The relation of humidity and ventilation to the leaf mold disease of tomatoes. Ohio Agr. Sta. Bimo. Bul. 13 (3): 119-122, 1928.

3. _____ and J. D. Wilson. A preliminary report on forced air ventilation for the control of Cladosporium leaf mold of greenhouse tomatoes. (Abstract) Phytopath. 19: 83. 1929.

4. Rice, W. H. Control of tomato mildew. Trials in Auckland District, season 1927-28. New Zealand Jour. Agr. 36: 99-102. Feb. 1928.

5. Small, T. Tomato leaf mould. Ann. Rep. Exp. & Res. Stat. Nursery & Mark. Gard. Industr. Devel. Soc. 13: 46-51. 1928.

Tomato - Bacterial Canker

BACTERIAL CANKER, APLANOBACTER MICHIGANENSE EFS.

This tomato disease was reported from Georgia, the northern States, Utah, and California, as reference to the table of loss estimates will show. In New York it was found mostly in the counties bordering on Lakes Erie and Ontario.

Georgia: On June 15, it was more prevalent than in 1927. Manure seemed to be a source of infection. The disease was first observed April 12 in a plant bed. A field of 30 acres of plants from this seed bed sustained a loss of 85 per cent. Other fields showed 5 to 75 per cent plant infection. The disease was observed in Tift and Thomas Counties in 1928. On September 15, 250 acres of Globe variety in Coffee County had suffered 42 per cent loss. Tests showed that the organism remained viable in compost 7 to 8 months. The results of another test indicate seed transmission. (Boyd)

Michigan: Appeared in many fields set with southern grown plants. (Nelson)

Wisconsin: Reported for the first time, probably seed-borne. (Vaughan).

California: Found August 28 in San Joaquin Valley and on September 4 in the Santa Rosa Valley causing relatively light losses in each case. (Shapovalov)

Utah: Linford (1927) reported this disease from seven counties with an average crop loss for the state of 12 per cent. During 1928 serious damage was noted by the writer in Utah, Weber, Davis, Boxelder, and Salt Lake counties. In Hunter and Magna districts of Salt Lake County the bacterial canker was found in four out of 17 fields visited. In these four fields an average of 30 per cent of the plants showed the trouble. One field exhibited the disease to the extent of 90 per cent of the plants. The disease in these districts, however, was less severe than in 1927. During the summer of 1927, 52 per cent of the fields studied in Hunter and Magna showed canker with an average infestation in the diseased fields of 26 per cent of the plants.

Table 11. Percentage losses from bacterial canker of tomato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
5-10	Michigan	Trace	Ohio, Indiana,
8	Utah		Wisconsin, Washington,
.5	New York		California

Tomato - Bacterial Canker

Recent literature

1. Bisby, G. R., and I. L. Conners. Plant diseases new to Manitoba. Sci. Agr. 8: 456-458. Mar. 1928.

2. Bryan, M. K. Bacterial canker of tomatoes. U. S. Dept. Agr. Circ. 29: 8 pp. 1928.

BACTERIAL WILT, BACTERIUM SOLANACEARUM EFS.

This tomato disease was reported by Poole (North Carolina)and Boyd (Georgia) to have caused 2.5 and 1 per cent loss respectively in 1928 while collaborators in Massachusetts, Maryland, (North Carolina), Tennessee, (Georgia), Florida, Mississippi, and Louisiana reported only small amounts.

Virginia: Not seen in Tidewater, Virginia. (McWhorter)

West Virginia: During the past 15 years bacterial wilt has been observed only in 6 or 7 scattered cases. It was not seen in 1928. (Archer)

North Carolina: Severe in heavy, sandy soil areas. (Poole)

Georgia: Distribution nearly as wide as Fusarium wilt, but not so prevalent or severe. More prevalent, however, in the larger commercial planting than Fusarium wilt. (Boyd)

Florida: Not so common as previously. (Weber)

Mississippi: Not reported last year but has been rather prevalent this year. (Neal, Wedgworth, & Miles)

BLOSSOM-END ROT, NON-PARASITIC

The distribution and severity is indicated in the accompanying table. West Virginia, Georgia, Florida, and Missouri reported less loss than usual while Utah reported the trouble much more serious than for years, especially on the early crop. An unusually severe occurrence was reported from Arkansas (July 15, V. H. Young) where loss in an 18 acre field was 75 to 80 per cent.

Utah: This trouble was reported as being especially severe throughout the state. In the Hunter and Magna districts it was found especially severe on the early crop and continued to appear in considerable quantity through the entire season. One farmer reported a loss of 35 per cent in his early crop from this trouble alone. (Richards)

Tomato - Blossom-end Rot

Ohio: Bad in greenhouses where it was more severe on light soils and after steam sterilizing. (Wilson)

Table 12. Percentage losses from blossom-end rot of tomato as estimated by collaborators, 1923.

Percentage loss	States reporting	Percentage loss	States reporting
5	Tennessee	Traces	New York, Massachusetts, North Carolina, New Jersey, Mississippi, Louisiana, Arkansas, Michigan, Wisconsin, Washington, North Dakota, Minnesota, Florida
2	Maryland, Georgia		
1.5	Iowa		
1	Missouri, Kansas, Utah, Arizona		
0.5	Ohio		

Recent literature: Pl. Dis. Reptr. 12: 66.

STREAK (VIRUS)

Streak in tomatoes has been reported from a few northern states, New York, Ohio, Michigan, Wisconsin, and from California with no state reporting more than a slight amount of the disease. The following notes from collaborators are interesting and show to what extent streak is important in field and greenhouse.

Ohio: Very damaging in certain greenhouses on heavy soil where early spring crop is forced with large quantities of fertilizer. Not as severe this year due to letup on heavy fertilizing. Has been found abundant on the first crop in a new house built over a potato field. Not troublesome on lighter soils at all. Common in milder form on outdoor crop but losses there very light. (Newhall)

Michigan: Found in College greenhouse in November affecting 10 per cent of plants. (Nelson)

Wisconsin: More than last year. Of growing concern to gardeners near Milwaukee. Greenhouse damage moderate, field damage slight. (Vaughan)

California: This disease which as a rule is of a very secondary importance in the San Fernando Valley this year destroyed in some fields 50 per cent of the crop or more. (Shapovalov)

Tomato - Streak

Recent literature: Pl. Dis. Reptr. 12: 108, 109, 133.

1. Anon. Botany and plant pathology. Ohio Agr. Exp. Sta. Bul. 417: 34-41. 1928.

2. Blood, H. L. A "streak" of tomatoes produced by a disturbing principle from apparently healthy potatoes in combination with tomato mosaic virus. Phytopath. 18: 311. Mar. 1928.

3. Doolittle, S. P. Soil transmission of tomato mosaic and streak in the greenhouse. (Abstract) Phytopath 18: 155. 1928.

MOSAIC (VIRUS)

Under this heading is considered the group of tomato "mosaic" diseases rather than any particular form.

The distribution and importance is shown to some extent in the accompanying table. In many cases mosaic was prevalent but did not cause large losses. In Massachusetts, Michigan, Washington, and Oregon, it was reported as serious in greenhouse-stock. The importance of volunteer plants, weeds, and other infected crops was mentioned by collaborators as sources of inoculum for general infections. Marglobe was reported very resistant by Essary (Tennessee).

A new form has been described as Aucuba mosaic by Bewley (1, 2). Kraybill, Brewer, Samson and Gardner (3) reported experiments on the relation of the filiform symptoms to the mottling symptoms.

Table 13. Percentage losses from mosaic of tomato, as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
5	Tennessee, Arizona		Louisiana, Arkansas,
1	Maryland, Iowa, Utah		Michigan, Wisconsin,
Trace	Vermont, Massachusetts		Montana, Washington,
	Delaware, West		California, New Jersey,
	Virginia, Mississippi,		North Carolina, Kentucky,
			Minnesota, Indiana

Tomato - Mosaic

Recent literature: Pl. Dis. Reptr. 12: 21, 108, 109, 146.

1. Bewley, W. F., and W. Corbett. "Mosaic" diseases of the tomato. Ann. Rep. Exp. & Res. Nursery & Mark. Gard. Industr. Devel. Soc. 13: 51-59. 1928.

2. _____ "Mosaic" disease of the tomato. Thirteenth Ann. Rept. Cheshunt Exper. & Res. Stat., Hertfordshire, 1927: 51-59. 1928.

3. Brewer, P. H., H. R. Kraybill, and M. W. Gardner. Purification and certain properties of the tomato mosaic virus. (Abstract) Phytopath. 19: 108. Jan. 1929.

4. Clayton, E. E. Increasing stands from vegetable seeds by seed treatment. New York (Geneva) Agr. Exp. Sta. Bul. 554: 16 pp. 1928.

5. Doolittle, S. P. Soil transmission of tomato mosaic and streak in the greenhouse. (Abstract) Phytopath. 18: 155. 1928.

6. Kraybill, H. R., P. H. Brewer, R. W. Samson and M. W. Gardner. The separation from mosaic tomato plants of toxins which produce some of the typical mosaic symptoms. (Abstract) Phytopath. 19: 108. Jan. 1929.

7. Smith, J. H. Experiments with a mosaic disease of tomato. Ann. Appl. Biol. 15: 155-167. May 1928.

8. Valleau, W. D., and E. M. Johnson. Observations and experiments on the control of true tobacco mosaic. Kentucky Agr. Exp. Sta. Bul. 280: 145-174. 1927.

9. Blood, H. L. A 'streak' of tomatoes produced by a disturbing principle from apparently healthy potatoes in combination with tomato mosaic virus. Phytopath. 18: 311. 1928.

10. Smith, J. H. The transmission of potato mosaic to tomato. Ann. Appl. Biol. 15: 517-528. Nov. 1928.

Tomato - Parasitic Diseases

MISCELLANEOUS PARASITIC DISEASES OF TOMATO

Disease	Cause	State reporting	Remarks
Fruit spot	Bacterial	Georgia, New Jersey, Texas	
Southern Sclerotium rot	Sclerotium rolfsii	Georgia,	Seen only in one field. (Boyd)
		Florida,	Not common on early crop. Usually severe during late spring and early summer. (Weber)
		Texas	
Late blight	Phytophthora infestans	Delaware,	Common but little loss. (Adams)
		Florida,	Localized areas. (Ramsey)
		California	Causing heavy losses in vicinity of Oxnard (Ramsey) and serious in southern California (Milbrath).
Leaf spot	Stemphyllium sp.	Florida	Reported in literature (9). (Weber)
Rhizoctonia	Corticium vagum B	Washington, Florida,	Scattered infections.
		New Jersey,	Damping off in seed beds. (Martin)
		Texas	
Root knot	Caconeman radicicola	Massachusetts, Georgia,	5 per cent loss in Georgia. (Boyd)
		Texas, Washington	
Root rot	Phymatotrichium omnivorum	Texas,	Serious, 5 per cent loss.
		Arizona	0.4 per cent loss.
Wilt	Sclerotinia sclerotiorum	Washington, Texas	One report. Serious.
Wilt	Verticillium albo-atrum	Washington,	Three reports.

Tomato - Parasitic Diseases

Disease	Cause	State reporting	Remarks
Wilt (cont.)	Verticillium albo-atrum	Massachusetts,	Serious in greenhouse and field. 3 per cent loss. (Guba
		New York	Present in Eden section.
Anthracnose	Colletotrichum phomoides	New Jersey, Indiana, West Virginia	Few fruits on market.
Bacterial spot	Bacterium vesicatorium	Delaware,	First report for stat Introduced with plan
		Tennessee, and Indiana	Traces
Nail head spot	Macrosporium tomato	Arkansas,	Common on early shipping varieties.
		Mississippi, Florida,	Not serious.
		North Carolina and Tennessee,	Traces.
		Georgia,	One per cent loss greatest damage in form of collar rot seedlings.
		Texas	
Fruit rot	Phoma destructiva	New York, Florida,	Following sunscald. Serious spotting of leaves and some of fruit.
		Texas	Traces in South Texas
Buckeye rot	Phytophthora terrestris	Florida, Arkansas	Localized.
Buckeye rot	P. parasitica	Indiana	In greenhouses.
Fruit rot	Macrosporium sp.	Wisconsin	Stem-end and side spo rot destroying one planting of two acre (Vaughan)

Tomato - Parasitic Diseases

Recent literature: Pl. Dis. Reptr. 12: 21-22, 66, 69, 71, 76, 97, 108, 109, 118, 143-144.

1. Brown, N. A. Tomato losses from center rot heavy in several states. U. S. Dept. Agr. Yearbook 1927: 628-630. 1928.

2. Carne, W. M. Spotted wilt of tomatoes. Jour. Dept. Agr. West. Australia II, 5: 58. Mar. 1928.

3. Doran, W. L. Acetic acid as a soil disinfectant. Jour. Agr. Res. 36: 269-280. 1928.

4. Hill, J. B. The migration of Bacterium tumefaciens in the tissue of tomato plants. Phytopath. 18: 553-563. 1928.

5. Milbrath, D. G. Late blight of tomato. Month. Bul. Dept. Agr. California 17: 271-274. Apr. 1928.

6. Noble, R. J. Spotted wilt in tomatoes. Agric. Gaz. New South Wales 34: 59-63. 1928.

7. Pritchard, F. J. Tomatoes resistant to nailhead rust now widely planted. U. S. Dept. Agr. Yearbook 1927: 630-633. 1928.

8. Rice, W. H. Control of tomato mildew. Trials in Auckland district, season 1927-28. New Zeal. Jour. Agr. 36: 99-102. Feb. 1928.

9. Weber, George F. A Stemphylium leaf spot of tomatoes. (Abstract) Phytopath. 19: 92. Jan. 1929.

10. Williams, P. H. The effect of some compounds on Verticillium wilt of the tomato. Ann. Rep. Exp. & Res. Stat. Nursery & Mark. Gard. Industr. Devel. Soc. 13: 38-41. 1928.

MISCELLANEOUS NON-PARASITIC DISEASES OF TOMATO

Disease	State reporting	Remarks
Hollow stem	Arkansas	One report of severe occurrence on early shipping crop (Young).
Cat face	Arkansas	Serious at one point.

Tomato - Non-parasitic Diseases

Disease	State reporting	Remarks
Yellowing	Florida	In the Everglades, yellowing with poor growth more pronounced in heavily fertilized fields. (Pritchard)
Leaf roll	New York	Caused by excess moisture.
Fruit cracking	Massachusetts	Cracking followed by rotting.
Oedema	Ohio	Present in houses where tomatoes were forced too hard. (Newhall)
Puffing	Texas	Very prevalent. Fifty per cent loss of full crop in Valley.
Center rot	Arkansas	On Acme variety.
Fumigation injury	Indiana	Fumigation of plants coated with copper-lime dust caused injury.

Recent literature: Pl. Dis. Reptr. 12: 133.

DISEASES OF SWEET POTATO

BLACK ROT, CERATOSTOMELLA FIMBRIATA (E. & H.) ELLIOTT

Black rot was fairly generally distributed over the sweet potato growing sections of southern United States. Previous estimates for this disease for past three years in Georgia have been too low, (Boyd). Porter (Iowa) reported 90 per cent infection in a 20 acre field. Efforts toward eradicating this disease in southeastern Missouri are meeting with excellent results, (Scott). North Carolina losses in storage and field have been heavy, (Poole). In Delaware there was a decided increase over the past few years (Adams). From Virginia and Maryland, J. I. Lauritzen reported as follows:

"On the eastern short of Virginia black rot is the most severe storage trouble (Jan. 1929), many houses showing 10 to 25, and higher per cent of this disease. In Maryland the disease is also bad but somewhat less than in Virginia. The situation has become so acute that through the activities of county agents and others a vigorous campaign is being initiated to control and eradicate black rot from the territory."

Sweet Potato - Black Rot

Table 14. Percentage losses from black rot of sweet potato as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
8	Texas	2	Missouri, Kansas,
7	Georgia		Arizona
5	Arkansas, Mississippi, New Jersey, North Carolina, Tennessee	1.5	Maryland
		.5	Iowa
		Trace	Indiana, New Mexico
3	Delaware, Georgia		

Recent literature: Pl. Dis. Reptr. 12: 134, 142-143.

STEM ROT, FUSARIUM BATATATIS WOLL.

As seen in the loss estimates, stem rot is of importance in certain sections of central and southeastern United States. Reports indicate that the disease first appears in May or June. The heaviest loss, 10 per cent, occurred in Georgia, where the disease has been more serious than previous reports indicate, and in New Jersey. Dry hot weather at setting time was favorable for infection in Iowa (Porter). Eight large plantings in southeastern Missouri were rejected by inspectors because of stem rot (Scott). General and damage severe in California (Kendrick).

Table 15. Percentage losses from stem rot of sweet potato, as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
10	Georgia, New Jersey	2	Arkansas, Tennessee
7	Iowa	1.5	Maryland
5	Kansas, Indiana	1	North Carolina
3	Missouri, Mississippi	Trace	Florida

Recent literature: Pl. Dis. Reptr. 12: 134, 14 -143.

1. Martin, W. H. Studies of sweet potato stem rot control. Ann. Rep. New Jersey Agr. Exp. Sta. 48: 225-232. 1928.

2. Poole, R.F. Further studies on the control of stem rot of sweet potatoes. (Abstract) Phytopath. 19: 84. Jan. 1929.

SCURF, MONILOCHAETES INFUSCANS HALS.

Scurf was about as generally distributed as the more serious sweet potato diseases but seemed to be doing but slight damage. In Delaware it was said to be very prevalent at harvest time (Adams). Slight amounts were reported from Maryland, Virginia, New Jersey, North Carolina, Georgia, Florida, Mississippi, Texas, Iowa, Arkansas, New Mexico, and Arizona. White varieties were reported most affected in New Mexico (Crawford). Inhibited by acid soil. Seed selection from disease-free area important. J. I. Lauritzen reported as follows, February 1, 1929:

"The outstanding malady of the Raleigh, North Carolina, section is scurf where the infection is general and severe without reference to either variety or the form from which the stock came. Potatoes in this region are generally stored in tobacco houses which serve very well. Diseases other than scurf were observed but no great amount of damage was being caused by them."

Recent literature: Pl. Dis. Reptr. 12. 134.

MOSAIC (VIRUS?)

Mosaic was reported as scattered but not causing any serious damage in Florida and Mississippi. In Texas it was said to be increasing.

Recent literature: Pl. Dis. Reptr. 12: 134.

OTHER DISEASES

Actinomyces sp., (Cystospora batata (E. & H.) Elliott) soil rot. Traces in New Jersey, Delaware, Maryland, North Carolina, Tennessee, Florida, Kansas, Texas, Arkansas.

Albugo ipomoeae-panduranae (Schw.) Sw., white rust. New Jersey.

Caconema radicicola (Greef) Cobb, root knot. Arkansas, North Carolina, New Jersey.

Diplodia tubericola (Ell. & Ev.) Taub., Java black rot. Florida, Texas.

Fusarium oxysporum Schl., surface rot. Mississippi. J. I. Lauritzen reported as follows from North Carolina:

"In the vicinity of Goldsboro, North Carolina, a striking example of the effect of rough handling on the occurrence of disease was noted. In one of the storage houses visited the potatoes were in very good condition with practically no disease and showing that they had been handled with extreme care during the harvest period and during subsequent curing and storage. In a second house, quite the reverse was true. The roots were generally bad and showed markedly the effects of rough handling, resulting in heavy infection of surface rot. Rhizopus soft rot was also abundant following wounds made by rats and mice." (January 1929).

Phyllosticta bataticola Ell. & Mart. Common in Florida; trace in Iowa.

Phymatotrichum omnivorum (Shear) Duggar. Root rot. Texas - prevalent in black lands with 10 per cent loss, Arizona - 1 per cent loss.

Plenodomus destruens Harter, foot rot. Traces from Maryland, Florida, Mississippi. A few outbreaks always occur in Princess Anne County, Virginia, according to McWhorter.

Pythium sp., mottle necrosis. Maryland (trace).

Rhizopus nigricans Erhnb. and Rhizopus spp., storage rots. Maryland; Mississippi (general); Kansas; Georgia; Texas; Arkansas; Mississippi; Kansas; New Jersey.

Sclerotium bataticola Taub., charcoal rot. Traces in Maryland, North Carolina, Georgia, Florida, Mississippi, Texas, Arkansas.

Sclerotium rolfsii Sacc., stem rot. Georgia (1 per cent loss); Mississippi (trace).

Recent literature: Pl. Dis. Reptr. 12: 134.

D I S E A S E S O F B E A N

ANTHRACNOSE, COLLETOTRICHUM LINDEMUTHIANUM (SACC. & MAGN.) BRIOSI & CAV.

Anthracnose was serious only in the states bordering the Great Lakes and the Atlantic Coast States north of Maryland as will be noted from table of loss estimates. General occurrence was reported from many states giving only a trace of loss. In Massachusetts, Guba reported differences in varietal susceptibility. In tests in Maryland the use of western seed gave 0.38 per cent and eastern seed 22.19 per cent disease (Hunter). Arkansas, Wisconsin, and New Mexico reported the disease worse than for 1927.

Bean - Anthracnose

Table 16. Percentage losses from anthracnose of bean, as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
25	New Hampshire	1	Michigan, Georgia, Louisiana
12	Massachusetts	0.1	Ohio
7	New York, Wisconsin	Trace	West Virginia, Texas, Arkansas, Iowa, Kansas, New Mexico, New Jersey, Indiana, North Dakota
5	Minnesota, Tennessee		
3	Florida, Mississippi		
1.5	Maryland		

Recent literature: Pl. Dis. Reptr. 12: 8-9, 23, 36, 64, 70, 96, 106.

1. Gloyer, W. O. Two new varieties of red kidney bean: Geneva and York. New York (Geneva) Agr. Exp. Sta. Tech. Bul. 145: 51 pp. July 1928.

2. Reddick, Donald. Building up resistance to diseases in beans. New York (Cornell) Agr. Exp. Sta. Memoir 114. 15 p. Mar. 1928.

BACTERIAL BLIGHT, BACTERIUM PHASEOLI EFS.

Blight caused by Bacterium phaseoli was general in its occurrence, the majority of states reporting it. Some interesting notes from collaborators were received.

Florida: Much worse than in previous years with a loss of 30 per cent in Gainesville section. Especially severe on account of wet weather. (Weber)

Louisiana: Very severe in Livingston Parish destroying entire fields. (Tims)

Michigan: Subnormal temperatures held blight infections down under favorable moisture conditions. (Nelson)

Wisconsin: More than usual, especially on Kidney wax and Giant Green Pod. (Vaughan)

Texas: Fairly prevalent. Very severe, probably transmitted by bean leaf hopper. (Taubenhaus & Bach)

Bean - Bacterial Blight

Colorado: Seems most serious on plants frosted previously. (LeClerg)

Montana: Common in eastern half of state. (Young)

Table 17. Percentage losses from bacterial blight (Bacterium phaseoli) of beans as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
10	Florida, Louisiana	1-3	New York
6	Wisconsin	1	Michigan, Arizona
5	Georgia, Minnesota	Trace	Massachusetts, New Jersey, West Virginia, Virginia, Indiana, Washington, Oregon
4	Montana		
3	Mississippi		
2	Maryland, Kansas		

Recent literature: Pl. Dis. Reptr. 12: 8-9, 23, 36, 95, 96, 107, 121-122.

1. Zaumeyer, W. J. Seed infection by Bacterium phaseoli. (Abstract) Phytopath. 19: 96. Jan. 1929.

HALO BLIGHT, BACTERIUM MEDICAGINIS PHASEOLICOLA BURK.

Halo blight was reported from Georgia, Florida, Wisconsin, and Montana. Plants of Bountiful snap beans suspected as being affected with this disease were also collected near Norfolk, Va. From Georgia O. C. Boyd reported as follows:

"This is the first year this disease has been reported from Georgia. It was very destructive to the early snap bean crop. Damage in individual fields ranged from a tract to 100 per cent, with all intermediate gradations. Red Valentine, Burpee's Stringless Green Pod, Bountiful and Masterpiece susceptible. Refugee not so badly affected."

Miss Hedges (1) reported on the prevalence of this disease.

Recent literature: Pl. Dis. Reptr. 12: 36, 95, 121-122.

1. Hedges, Florence. Bacterial diseases of beans in some western commercial seed growing and canning areas and southern trucking sections in 1927 and 1928. Pl. Dis. Reptr. 12(11): 121-122. October 15, 1928.

MOSAIC (VIRUS)

Mosaic of bean was reported as general in many States. As noted in reports of previous years the disease appeared to be more serious in the Western States. Special notes from some of the collaborators are of interest.

Delaware: Several commercial plantings were seriously stunted and yields greatly reduced. (Adams)

Maryland: Found only in the Refugee variety. (Hunter & Jehle)

West Virginia: As usual the infection was slight and scattered. (Archer)

Georgia: Observed more serious in Refugee variety. (Boyd)

Michigan: Losses now largely confined to canning crop and garden varieties. Stringless Refugee strains always show percentage of mosaic. (Nelson)

Wisconsin: More on Refugee than other varieties. (Vaughan)

Texas: Very prevalent in lower Rio Grande Valley following leaf hopper injury. (Taubenhaus & Bach)

Montana: Disease particularly common and destructive on Great Northern variety. (Young)

Utah: In Hunter and Magna districts mosaic was found in every one of the 7 fields visited. Although at times difficult to diagnose in the presence of chlorosis so prevalent in these districts, it was evident that serious losses resulted. As high as 83 per cent of the plants with mosaic were noted in one field. (Richards)

Table 18. Percentage losses from mosaic of bean as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
8	Utah	1	Massachusetts, Wisconsin
5	Kansas, Washington	Trace	New York, New Jersey,
4	Montana		Maryland, West Virginia,
3	Mississippi, Arizona		Georgia, Indiana,
			Michigan, Florida

Bean - Mosaic

Recent literature: Pl. Dis. Reptr. 12: 64, 95, 107.

1. Dufrenoy, J. Modifications des mitochondries et des plastides dans les cellules de feuilles de haricots affectees de mosaique. (Modifications in the mitochondria and plastids of the leaf cells of beans affected by mosaic). Comptes Rendus Soc. de Biol. 98: 373-374. 1928.

2. Fajardo, T. G. Progress on experimental work with the transmission of bean mosaic. (Abstract) Phytopath. 18: 155. 1928.

3. Harter, L. L. The bean disease situation in some western states. The V & F Pathologist (Mimeographed) 1 (19): 73. Sept. 15, 1928.

4. Clayton, E. E. Toxicity of mercury and copper compounds in relation to their use for seed treatment and spraying. (Abstract) Phytopath. 19: 86. 1929.

RUST, UROMYCES APPENDICULATUS (PERS.) LINK

Rust was reported as causing slight losses from Massachusetts, New York, New Jersey, Maryland, West Virginia, Georgia, Mississippi, Indiana, Wisconsin, Texas and California. In many cases it appeared too late in the season to cause any loss.

Recent literature: Pl. Dis. Reptr. 12: 36.

1. Waters, C. W. The control of teliospore and urediniospore formation by experimental methods. Phytopath. 18: 157-213. 1928.

DRY ROOT ROT, FUSARIUM MARTII PHASEOLI BURK. & FUSARIUM SPP.

Fusarium root rots were reported as causing slight losses in Massachusetts, Tennessee, Maryland, West Virginia, Florida, Michigan, Montana, New York, Virginia, Georgia, Mississippi, Iowa, Utah, and California. Severe infections were in all cases reported to be localized in particular fields. General occurrence was reported from eastern Montana and California. A new Fusarium disease was reported from California by Harter (1).

Bean - Dry Root Rot

Recent literature: Pl. Dis. Reptr. 12: 54.

1. Harter, L. L. A Fusarium disease of beans. (Abstract) Phytopath. 19: 84. Jan. 1929.

OTHER DISEASES

Botrytis cinerea Pers., grey mold rot. Maine, first report for state. (Folsom)

Caconema radicicola (Greef) Cobb, root knot. Georgia, less serious in commercial plantings than usual; 2 per cent loss. (Boyd). Trace in Mississippi, prevalent in Texas (Taubenhaus).

Cercospora cruenta Sacc., leaf blotch. Georgia - only mere traces but ordinarily quite prevalent in late plantings. (Boyd). Florida - common but not serious. (Weber)

Erysiphe polygoni DC., powdery mildew. District of Columbia, Texas, Utah - found in a single field (Richards). California - general along coast section, not serious (Kendrick).

Isariopsis griseola Sacc., angular leaf spot. Slight infections in West Virginia, Pennsylvania and Indiana.

Macrophomina phaseoli (Maubl.) Ashby, stem and root rot. Traces only in Georgia where disease was especially injurious in 1927. Also reported from Mississippi where earliest occurrence was July 25.

Phoma sp., root rot. Isolated case of wilting plants from which Phoma was isolated in Georgia (Boyd).

Phyllosticta phaseolina Sacc., leaf spot. Scattered infections in West Virginia and Florida.

Rhizoctonia sp., root rot. Delaware, Mississippi, Florida, Georgia, Maryland, North Carolina, West Virginia, New Jersey, Texas.

Sclerotinia sclerotiorum (Lib.) Mass. Trace in New York, West Virginia, Washington.

Sclerotium rolfsii Sacc., southern sclerotium rot. Georgia - one per cent loss; least amount of the disease yet observed (Boyd.). Mississippi.

Curly top (virus). More often noted seriously affected than any other crop besides tomatoes.

Chlorosis. Texas - considerable in lower Rio Grande Valley. Utah - Chlorosis is by far the most serious trouble on the bean in the Hunter and Magna districts. Every field visited exhibited serious trouble and in some cases total failure resulted. The major part of the trouble seemed to result from an alkalin condition of the soil. (B. L. Richards)

Hopperburn. New Jersey.

Lightning Injury. New Jersey.

Recent literature: Pl. Dis. Reptr. 12: 23, 36, 106, 121-122, 144.

1. McKay, M. B. The curly top disease. Seed World 23 (13): 38, 40, 72. June 29, 1928.

2. Severin, H. H. P., and C. F. Henderson. Some host plants of curly top. Hilgardia 3: 339-392. June 1928.

3. Small, W. Mycological notes (13). Further notes on Rhizoctonia bataticola. Trop. Agr. Ceylon 70: 227-231. Apr. 1928.

D I S E A S E S O F L I M A B E A N

Bacterium phaseoli EFS. Georgia - more prevalent than usual. (Boyd). Maryland - present but causing little damage (Whitney).

Bacterium vignae Gard. & Kend. (Bacterium viridifaciens T. & W.), bacterial spot. Maryland - reported from eastern Maryland and from Long Island, New York, as general, but causing only little damage. Georgia - common on early and spring crop but more injurious to summer planting or fall crop causing marked defoliation (Boyd). Indiana.

Colletotrichum lindemuthianum (Sacc. & Magn.) B. & C., anthracnose. Georgia - common but not destructive in early crop, most injurious in fall crop, causing 2 per cent loss.

Diaporthe phaseolorum (C. & E.) Sacc., pod blight. common on Eastern Shore in Maryland. Also in New Jersey. Slight damage.

Erysiphe polygoni DC., powdery mildew. New Jersey.

Phytophthora phaseoli Thax., downy mildew. Reported from Maryland, Ohio, New York.

Phymatotrichum omnivorum (Shear) Duggar. Root rot. Texas.

Lima Bean

Rhizoctonia solani Kühn, stem rot. Maryland - prevalent but doing little damage. (Hunter)

Leaf-scorch (non-parasitic). New York.

Curly top (virus). Oregon.

Recent literature: Pl. Dis. Reptr. 12: 37, 96, 110, 116, 117.

MUNG BEAN

Phyllosticta phaseolina Sacc., leaf spot. New York, first report to survey.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas, first report to survey.

DISEASES OF ONION

SMUT, UROCYSTIS CEPULAE FROST

Onion smut was reported from New York, Maryland, Ohio, Wisconsin, Minnesota, Iowa and Oregon. In every case it was said to be localized and in most cases losses were being reduced through the formaldehyde drip planting practice.

Ohio: Estimated reduction in yield 5 per cent.

Iowa: Formaldehyde reduced infection from 80 to 10 per cent. (Porter)

Recent literature: Pl. Dis. Reptr. 12: 66, 107.

DOWNY MILDEW, PERONOSPORA SCHLEIDENI UNG.

Traces of downy mildew were reported from Maryland, Colorado and Oregon, 1 to 2 per cent from Massachusetts, New York, and Michigan and per cent from California. Most collaborators mentioning the disease indicated that it was much less prevalent than usual. Wisconsin: Onions

not grown this year on marsh where the disease has been previously reported (Vaughan). In Oregon this disease was not much of a problem in commercial plantings where it is effectively controlled by Bordeaux. (Dykstra). In California it was widely distributed on seed crop; loss about 5 per cent (Milbrath).

Recent literature: Pl. Dis. Reptr. 12: 107.

PINK ROOT, FUSARIUM MALLI TAUB. OR PHOMA SP.

Pink root was reported as causing slight losses in Massachusetts, New York, Maryland, Missouri and Minnesota, and as causing about 2 per cent loss in Ohio. In addition to these cases the disease was reported on Bermuda plants shipped into Arkansas where the injury does not seem to be outgrown. It was found for the first time in Iowa causing severe loss at Clear Lake in north central part of state. In Colorado the disease caused considerable damage about Littleton on late planted stock (LeClerg). A similar disease was reported from Oregon but had not been identified as F. Malli. In California it was reported by Kendrick under the name Phoma sp. as general wherever onions are grown.

Recent literature: Pl. Dis. Reptr. 12: 36, 107.

BOTRYTIS STORAGE ROTS, BOTRYTIS SPP.

Botrytis squamosa Walker, small sclerotial neck rot. Reported for first time as causing soft rot of leaves in Maine (Folsom). Also contributed to a 2 per cent loss in white sets from several sections in Wisconsin (Wellman). First occurrence also reported from Iowa.

Botrytis allii Munn, neck rot. One case in New Jersey and a 6 per cent loss in Colorado also reported by Wellman (Wisconsin) as contributing with B. squamosa and B. byssoides to a 2 per cent loss in white sets grown near Kenosha. He has made the following comment:

"It is interesting to note that two Chicago concerns, shippers of onion sets, have been drying all white sets they are shipping or storing. Drying of white sets, so the writer was informed by the head of one of the firms, will be considered a standard treatment every year in the future."

A more complete statement concerning the neck rot situation was contributed by Wellman in the Plant Disease Reporter (12: 123-124, October 15, 1928). In this connection, attention is called to the error that was made in publishing this report whereby the name of J. C. Walker appears as the author rather than that of F. C. Wellman.

Onion - Storage Rots

Botrytis byssoidea Walker, mycelial neck rot. Associated with B. allii and B. squamosa in causing loss in Wisconsin.

Botrytis cinerea Pers. and Botrytis sp., gray mold rot. New York - a trace found (Chupp). Virginia - more prevalent than usual (Wingard). Also reported from Louisiana and Illinois.

Recent literature: Pl. Dis. Reptr. 12: 107, 124.

YELLOW DWARF (VIRUS)

This disease has been recognized as a virus disease by Iowa workers (1 and 3) and was reported from that state early in 1928 (2). The same disease was brought to the attention of the Plant Disease Survey in a special report from J. C. Walker, extracts from which follow:

"During the last of July a careful survey was made by L. J. Alexander of onions in southeastern Wisconsin where plants are grown for bulbs from sets and seed ..... Seventy-five fields of bulb onions from seed (about 350 acres) and 19 fields of bulb onions from sets (about 65 acres) were visited. Three fields from seed and two from sets were apparently free from the disease. Seventeen fields from seed and seven from sets showed only a trace. Thirteen fields from seed and two fields from sets showed more than 1 per cent diseased plants. Of those showing over 1 per cent disease, among those from seed one showed 25 to 40 per cent, two showed 33 per cent, and one showed 19 per cent, and one showed 15 per cent; among those from sets one showed 50 per cent.

"It is important to note that this disease is prevalent throughout this district and, though mild in its effects at present, is widespread and should be watched for carefully next season here as well as in other regions."

According to a recent statement from Giddings this disease appears to be similar to if not the same as that reported to the Plant Disease Survey from West Virginia in 1917 and 1918 as mosaic.

Yellow dwarf is characterized by marked yellow streaks up and down the stems and leaves followed by loss of turgidity to the extent that the tops lop over on the ground. Such plants do not die at once but linger along without growth. The bulbs are stunted. The disease is carried in the vegetative stage, in sets, and in mother bulbs but does not appear to be seed-borne. It has been transmitted to the growing point of bulbs by juice transfers, symptoms appearing after an incubation period of about twelve days which indicates that it is a virus trouble.

It was first found in Iowa in the Pleasant Valley section during the latter part of May and on July 2 in the onion growing region of south-

eastern Wisconsin. In both cases the disease appears to be localized but losses in individual cases have reached 25 to 50 per cent.

Recent literature: Pl. Dis. Reptr. 12: 93.

1. Melhus, I. E., and W. J. Henderson. The yellow dwarf of onions. (Abstract) Phytopath. 19: 86. Jan. 1929.

2. _____, C. S. Reddy, W. J. Henderson, and E. Vestal. A new virus disease epidemic on onions. Phytopath. 19: 73-77. 1929.

3. Porter, R. H. New onion disease in Iowa. The Plant Disease Reporter 12: 93. Sept. 1, 1928.

OTHER DISEASES

Aspergillus niger Tiegh., black mold. Ohio, on Cincinnati market.

Colletotrichum circinans (Berk.) Vogl., smudge. Wisconsin.

Macrosporium porri Ell., purple blotch. Virginia, Illinois, Wisconsin, Iowa.

Macrosporium sarcinula parasiticum Thuem., black stalk rot. New York, Washington.

Sclerotium cepivorum Berk., white rot. Ohio, on Cincinnati market.

Flooding damage. New York, in Elba district, 50 to 75 per cent loss, in Wayne and Oswego Counties, 15 per cent.

White blast (non-parasitic). General in Connecticut Valley, Massachusetts. On Portugese onions grown near Boston (Guba).

Recent literature: Pl. Dis. Reptr. 12: 107,119, 124.

1. Ayyangar, C. R. A leaf spot and blight disease of onions caused by Alternaria palandui nov. sp. Bul. Agr. Res. Inst. Pusa 179: 14 p. 1928.

2. Gilbert, B. E., and F. T. McLean. A 'deficiency disease': the lack of available manganese in a lime-induced chlorosis. Soil Science 26 (1): 27-31. 1928.

3. Palo, Macario A. A Fusarium causing bulb rot of onion in the Philippines. Philipp. Agr. 17: 301-316. Nov. 1928.

4. Sackett, W. G. Report of Bacteriologist. Ann. Rept. Colorado Agr. Exp. Sta. 40: 20-24. 1927.

5. Ramsey, G. B., and L. F. Butler. Injury to onions and fruits caused by exposure to ammonia. Jour. Agr. Res. 37: 339-348. Sept. 15, 1928.

DISEASES OF CRUCIFERS

CABBAGE

BLACKLEG, PHOMA LINGAM (TODE) DESM.

Like the other cabbage diseases reported this year blackleg was present in isolated cases only in the various states named in the table. Seed treatment was mentioned in New York and Wisconsin reports as materially lowering the amount of disease.

Table 19. Percentage losses from blackleg of cabbage, as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
1.5	Maryland		Florida, Mississippi,
1	Massachusetts, New York:		Louisiana, Arkansas,
Trace	New Jersey, West Virginia, Tennessee, North Carolina,		Ohio, Indiana, Wisconsin, Minnesota, Iowa, Nebraska, Colorado, Oregon

Recent literature: Pl. Dis. Reptr. 12: 122-123, 134.

1. Clayton, E. E. Seed treatment for blackleg disease of crucifers. New York State Agr. Exp. Stat. Techn. Bul. 137: 58 p. May 1928.

YELLOWS, FUSARIUM CONGLUTINANS WOLL.

The reports indicate (see table 20) that yellows was most prevalent in Maryland. In West Virginia the disease is reported to be held in check

by rotation (Archer). In Wisconsin the disease occurred in destructive amount only on "sick" soils where non-resistant seed was used (Vaughan). Cool weather in Iowa from May 25 to harvest prevented the development of yellows (Porter). In southeastern Missouri the disease was unusually severe because of reluctance of growers to use control measures.

Table 20. Percentage losses from cabbage yellows as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
			West
8	Maryland	Trace	Virginia, Tennessee,
3	Iowa		North Carolina, Florida,
2	Missouri		Mississippi, Ohio,
1	Kansas		Indiana, Wisconsin,
Trace	North Carolina,		Minnesota, Colorado

Recent literature: Pl. Dis. Reptr. 12: 96, 122-123, 134.

1. Gregory, C. T. New yellows resistant varieties of cabbage in Indiana. Proc. Indiana Acad. Sci. 37: 381-383. 1928.

2. Thomas, R. C., and R. Magruder. Early cabbage resistant to the yellows disease. Ohio Agr. Exp. Sta. Bimonth. Bul. 13: 142-144. July-Aug. 1928.

3. Walker, J. C., and F. L. Wellman. A survey of the resistance of subspecies of Brassica oleracea to yellows (Fusarium conglutinans). Jour. Agr. Res. 37: 233-241. Aug. 15, 1928.

BLACK ROT, BACTERIUM CAMPESTRE (PAM.) EFS.

Black rot was reported only from the eastern half of the United States with severe losses reported only from New York, Tennessee, and Louisiana. In most cases there was only localized infection. In Virginia, it occurred in most fields in Washington County. Ten per cent of the plants were affected in some fields. One field in Smyth County had 95 per cent plants affected (Wing. d). In Louisiana the disease was severe in cabbage and cauliflower where seed treatment was not practiced (Tims). In Iowa rainy weather in June favored development of the disease (Porter). Wellman (2) has reported successful control of black rot in southeastern Wisconsin and northern Illinois by means of seed treatment. Chupp (New York) reported the organic mercury compounds less effective for seed treatment than corrosive sublimate.

Cabbage - Black Rot

Table 21. Percentage losses from black rot of cabbage as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
19	Tennessee	Trace	West Virginia, Virginia, Florida, Mississippi, Indiana, Wisconsin, Minnesota, Texas.
5-10	Louisiana		
1-3	New York		
.5	Iowa		
Trace	New Jersey, Maryland		

Recent literature: Pl. Dis. Reptr. 12: 122, 134.

1. Chupp, Charles. Club root in relation to soil alkalinity. Phytopath. 18: 301-306. 1928.

2. Wellman, F. L. Plant Disease Reporter 12 (11): 122-123. Oct. 15, 1928.

CLUB ROOT, PLASMODIOPHORA BRASSICAE WOR.

During the past year club root was of very minor importance as it was reported as severe in isolated cases only from Massachusetts, New Jersey, Maryland, North Carolina, Ohio, Minnesota, and Wisconsin, with the heaviest infections occurring in New York where 2 to 3 per cent loss was reported by Chupp. In Ohio 1 per cent loss was estimated. In New York and Wisconsin the disease is reported to be growing more serious fr year to year. Wellman (Wisconsin) in a special report says:

"Hydrate of lime at the rate of two tons to the acre has proved a successful inhibitant and appears to remain effective for a number of years. Pure carbonate of lime, ground limestone, or burnt lime fully airslaked, appear practically incapable of disease inhibition."

Recent literature: Pl. Dis. Reptr. 12: 110,123, 134.

1. Blunck, H. Versuch zur vergleichenden Prufung chemischer Mittel gegen Kohlhernie. Gartenbauwissensch. 1: 154-176. June 1928.

2. Chupp, C. Club root in relation to soil alkalinity. Phytopath. 18: 301-306. Mar. 1928.

3. Kindshoven, J. Entseuchung des Bodens und Bekämpfung der Kohlhernie mit Kalkstickstoff. Mitt. Deut. Landw. Ges. 43: 522-523. June 2, 1928. (Abs. Rev. Appl. Myc. 7:

4. Kohne. Kohlhernie-Bekämpfung mit Uspulun. Nachricht. uber Schädlingsbekämpf. 3 (2): 61-65. 1928. (Abs. Rev. Appl. Myc. 7: 757. Dec. 1928.)

5. Preston, N. C. Experiments on the control of finger and toe in cabbages by the use of mercuric chloride and other substances. Welsh Jour. Agric. 4: 280-295. 1928. (Abs. Rev. Appl. Myc. 7: 756. Dec. 1928.)

OTHER DISEASES

Alternaria brassicae (Berk.) Sacc., black leaf spot. New Jersey, Massachusetts, New York, West Virginia, Florida, Texas, Indiana, Louisiana.

Bacillus carotovorus L. R. Jones, soft rot. Massachusetts.

Bacterium maculicola McC. peppery leaf spot. Trace in New York and 2 per cent loss in Georgia. McCulloch (3) has recently called attention to the correct spelling for this organism.

Corticium vagum B. & C. and Rhizoctonia spp., damping off and wire stem. Wisconsin, and Illinois (2 to 10 per cent loss in seed beds). Washington, Massachusetts, New York (1 per cent loss). New Jersey (trace) and Texas (common in seed beds). Rhizoctonia also caused decay of foliage leaves touching the ground and a few affected heads were found in cabbage sections of Illinois, Indiana, and Wisconsin. The perfect stage was found under cabbage plants in several fields in Wisconsin (Wellman).

Peronospora parasitica (Pers.) DeBy., downy mildew. New York, trace on seed cabbage; New Jersey, trace; Georgia, unusually widespread and severe as seedling disease causing 5 per cent loss. The variety Succession appears most susceptible. Late seedlings are worst affected and severe attack of aphis seemed to increase damage from the disease (Boyd). In Texas it was very prevalent on early cabbage and in seed beds.

Sclerotinia sclerotiorum (Lib.) Mass., drop. Localized occurrence in Massachusetts and Florida.

Sclerotium rolfsii Sacc., stem rot. Mississippi, Texas.

Head cracking, non-parasitic. Massachusetts.

Internal black spot, non-parasitic. Washington.

Oedema, non-parasitic. New Jersey, Texas.

Tipburn, non-parasitic. New York in late cabbage.

Recent literature: Pl. Dis. Reptr. 12: 96, 123.

1. Lauer, K. W. An organic mercury compound for the control of damping off of seedlings grown under glass. Proc. Pennsylvania Acad. Sci. 2: 37-39. 1928.

2. Miller, L. P. Manganese deficiency in sand cultures. Amer. Fertilizer 68(7): 21-22. 1928.

3. McCulloch, L. Bacterium maculicola (McC.) nom. emend. syn. Bacterium maculicolum. Phytopath. 18: 460. May 1928.

B R O C C O L I

Alternaria brassicae (Berk.) Sacc., black leaf spot. Texas.

Plasmodiophora brassicae Wor., club root. New York.

B R U S S E L S S P R O U T S

Bacterium campestre (Pam.) EFS., black rot. New York, more common than usual in newly planted fields of brussels sprouts. (Clayton, August 1

C A U L I F L O W E R

Alternaria brassicae (Berk.) Sacc., black leaf spot. New Jersey, Texas.

Bacterium campestre (Pam.) EFS., black rot. New York, causing 1 to 2 per cent loss, New Jersey.

Bacterium maculicola McC., peppery leaf spot. New York, trace.

Caconema radicicola (Greef) Cobb. Root knot. New Jersey.

Fusarium conglutinans Woll. Yellows. New Jersey.

Peronospora parasitica (pers.) D.By. Downy mildew. New Jersey.

Plasmodiophora brassicae Wor., club root. New York, trace; New Jersey.

Rhizoctonia sp., wire stem. New York, 1 to 2 per cent loss.

Cauliflower

Recent literature

1. Quanjer, H. M. De invloed van kaligebrek op de vatbaarheid van bloemkool voor Peronospora parasitica. (The influence of potash deficiency on the susceptibility of cauliflower to Peronospora parasitica). Tijdschr. Plantenz. 34: 254-256. Oct. 1928.

CHINESE CABBAGE

Cercosporella albo-maculans (Ell. & Ev.) Sacc., leaf spot. Massachusetts on Petsai variety.

Plasmodiophora brassicae Wor., club rot. Ohio.

Erysiphe polygoni DC., powdery mildew. Reported by Davis (1) from Massachusetts. First report to Survey.

Recent literature: Pl. Dis. Reptr. 12: 110.

1. Davis, W. H. A powdery mildew parasitizing Chinese cabbage. Phytopath. 18: 611-615. July 1928.

COLLARDS

Fusarium conglutinans Woll., yellows. Mississippi.

HORSERADISH

Bacterium maculicola McC., peppery leaf spot. Connecticut.

Caconema radicicola (Greef) Cobb, root knot. Mississippi.

Cercospora armoraciae Sacc., leaf spot. West Virginia, and Indiana, trace.

Recent literature: Pl. Dis. Reptr. 12:77.

KALE

Bacterium campestre (Pam.) EFS., black rot. New York, trace.

KOHLRABI

Plasmodiophora brassicae Wor., club root. New Jersey.

MUSTARD

Albugo candida (Pers.) O. Kuntz, white rust. Florida, common; Texas.

RADISH

Aphanomyces raphani Kend., black root. Indiana, California, White Icicle variety.

Bacterium campestre (Pam.) EFS., black rot. Iowa, one report.

Recent literature

1. White, H. E., and M. W. Gardner. Bacterial spot of radish and turnip. (Abstract) Phytopath. 19: 97. Jan. 1929.

RUTABAGA

Recent literature

1. Anon. Mottled heart of swedes. New Zealand Jour. Agr. 35(6): 404. 1927.

2. Bartlett, A. W. Olphidium radicicolum De Wildeman and the "hybridisation nodules" of swedes. Trans. Brit. Mycol. Soc. 13: 221-238. Oct. 1928.

3. Dawson, M. L., and A. H. Povah. A new Rhizopus rot of rutabaga. Science n.s. 68: 112. Aug. 3, 1928.

4. Jorgensen, C. A. Gulspidssygen. Dens Udbredelse, Aarsager og Bakaempelse. (Yellow tip disease. Its distribution, causes and control.) Tidsskr. for Planteavl. 34(I): 76-116. 1928. (Abs. Rev. Appl. Myc. 7: 396, June 1928)

5. Murphy, P. A. The connexion between dry rot of swedes in New Zealand and British seed. Nature 122: 13-14. July 7, 1928.

6. Paine, S. G., and R. L. Nirula. Studies in bacteriosis. XV. A disease of swedes and turnips. Ann. Appl. Biol. 15: 45-56. Feb. 1928.

TURNIP

Albugo candida (Pers.) O. Kuntz, white rust. Texas.

Bacterium campestre (Pam.) EFS., black rot. Mississippi.

Caconema radicicola (Greef) Cobb, root knot. Georgia, Texas.

Cercosporella albo-maculans (Ell. & Ev.) Sacc., leaf spot. Georgia, causing 1 per cent loss through defoliation in garden and commercial plantings (Boyd). Mississippi, seen first March 26.

Cercospora sp., leaf spot. Georgia.

Erysiphe polygoni DC., powdery mildew. Indiana.

Fusarium spp., stem rot. Washington.

Macrosporium sp., leaf spot. Georgia, of little importance.

Peronospora parasitica (Pers.) D.By., downy mildew. West Virginia, found in one field only.

Sclerotinia sclerotiorum (Lib.) Mass., Mississippi.

Sclerotium rolfsii Sacc., stem rot. Florida, several reports on late crop.

DISEASES OF CUCURBITS

CUCUMBERS

BACTERIAL WILT, BACILLUS TRACHEIPHILUS EFS.

The distribution and severity is indicated in the table. Adams (Delaware) reported less than last year. McWhorter (Virginia, July 21) reported the disease more severe than in 1927, the severity not being correlated with the presence of beetles which were relatively few but an unusually large proportion appeared to be active carriers. Wilson (Ohio, September 1) reported a loss of 10 per cent in many fields. In Michigan and Wisconsin, the injury is principally in greenhouses.

Table 22. Percentage losses from bacterial wilt of cucumber as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
5	Massachusetts, West Virginia	Trace	Maine, Connecticut, Indiana, New Jersey,
3	Iowa		Michigan, Wisconsin,
2	New York		Minnesota, Missouri,
1	Ohio, Kansas		Colorado, Delaware,
0.1	Maryland		Georgia

Recent literature: Pl. Dis. Reptr. 12: 65, 110.

ANTHRACNOSE, COLLETOTRICHIUM LAGENARIUM (PASS) ELL. & HALS.

Anthracnose was reported on August 15 as being prevalent in Delaware on leaves but causing no losses. McWhorter(Virginia) mentioned it as being important in hotbed crops. It was reported as being more prevalent than in 1927 in some localities in Florida but causing slight general loss. In Ohio it was present in occasional outdoor plantings but was more common under glass, caused little loss. In Indiana the disease occurred in greenhouses only. It was found also in Minnesota.

Recent literature: Pl. Dis. Reptr. 12: 24.

ANGULAR LEAFSPOT, BACTERIUM LACHRYMANS EFS & MKB.

Serious infections of angular leafspot on cucumber were reported from Florida where the yield was cut ten per cent and the grade fifteen per cent, influenced by favorable moisture and temperature as reported by Weber. Chupp reported the disease general in the western half of New York with 1 to 2 per cent loss. Traces were reported from Delaware, Virginia, Indiana, Michigan, Wisconsin, Illinois, Minnesota, and Oregon.

Recent literature: Pl. Dis. Reptr. 12: 24, 125.

MOSAIC (VIRUS)

Mosaic was the most serious of the cucumber diseases reported in 1928. Losses appear in the accompanying table. Some interesting points are brought out in the following comments by collaborators.

New York: Mosaic appeared on Long Island late in July and by August 15 many fields are 100 per cent affected. Eradication of perennial weed hosts failed to give any control, either in 1927 or 1928. (Clayton). Much less upstate, still severe on Long Island (Chupp).

Maryland: Has been reduced by destruction of weed carriers and roguing of cucumber fields (Jehle).

Virginia: Has so far proven of little or no importance on cucumbers in Tidewater Virginia this season (McWhorter).

West Virginia: One case of severe infection in 1928 (Archer).

Kentucky: Cucumber mosaic collected in western Kentucky proved to be tobacco ring spot when inoculations were made on tobacco (Valleau).

Florida: Not yet important but apparently on the increase (Weber).

Ohio: Present on fruits in a number of fields in central Ohio (Wilson).

Iowa: Cucumbers are not grown as extensively now as in 1920-1923 due to mosaic and bacterial wilt (Porter).

Missouri: Was quite severe in several local plantings, the fruit showing severe infection (Scott).

New Mexico: Unusually severe on the fruit but not on vines (Crawford).

Cucumber - Mosaic

Oregon: Typical mosaic or white pickle collected for the first time in Oregon (Barss).

Table 23. Percentage losses from mosaic of cucumber as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
15	New York	Trace	New Jersey, Virginia,
10	Kansas		West Virginia, Kentucky,
8	Massachusetts		Florida, Mississippi,
5	Wisconsin, Iowa		Texas, North Dakota,
3	Maryland		Minnesota, Missouri,
0.5	Ohio		Oregon

Recent literature: Pl. Dis. Reptr. 12: 54, 65, 96, 119, 135, 146.

1. E. E. Clayton. Breeding for resistance to cucumber mosaic disease. (Abstract) Phytopath. 19: 85. Jan. 1929.

2. R. H. Porter. Reaction of Chinese cucumbers to mosaic. (Abstract) Phytopath. 19: 85-86. Jan. 1929.

DOWNY MILDEW, PSEUDOPERONOSPORA CUBENSIS (BERK. & CURT.) ROSTEW.

Reported to have caused as much as 30 per cent loss in scattered locations in Massachusetts. It appeared in Florida as early as May 10 and by June 10 had killed all the plants in certain fields. It was prevalent in the lower Rio Grande Valley of Texas, according to Taubenhaus. Traces of the disease were found in West Virginia, Maryland, North Carolina, and Georgia.

Recent literature: Pl. Dis. Reptr. 12: 24, 199.

SCAB, CLADOSPORIUM CUCUMERINUM ELL. & ARTH.

Reported by Folsom to be the only severe disease of the crop in Maine. Also prevalent in Massachusetts with 5 per cent loss. The heaviest losses were experienced in New York with state wide distribution and a 15 per cent loss estimated by Chupp. A 5 per cent loss was given by Nelson for Michigan while scattered infections only were mentioned by Vaughan (Wisconsin) and Wilson (Ohio).

Recent literature: Pl. Dis. Reptr. 12: 97.

OTHER DISEASES

Caconema radicicola (Greef) Cobb. Root knot. New Jersey, Severe in greenhouses; Florida, common; Georgia, common; Texas, Arizona, Washington, one report.

Erysiphe cichoracearum DC. Powdery mildew. Massachusetts, common in greenhouses causing 2 per cent loss. New York, trace; New Jersey, Florida, less than last year; Iowa, first report from state; Texas, 1 per cent loss.

Macrosporium cucumerinum Ell. & Ev., leaf blight. Traces in New York, New Jersey, Florida, Louisiana, Texas, Ohio, Minnesota, Iowa, and 2 per cent loss in Maryland.

Pythium sp., damping off. New Jersey, general under field conditions.

Sclerotinia sclerotiorum (Lib.) Mass., timber rot. Washington, one report.

Mycosphaerella citrullina (COS.) Gross, gummy stem blight. New Jersey.

Curly top (Virus). Limiting factor in culture of crop in areas where leaf hoppers are bad. Reported for Oregon.

Recent literature: Pl. Dis. Reptr. 12: 24, 146.

1. Beck, A. Verhütung und Bekämpfung der an den Treibgurkenpflanzen auftretenden Pilz-oder Fleckenkrankheiten. Möllers Deut. Gärtn.-Zeit. 43: 195-196, 235-236. 1928.

2. Guba, E. F. Control of cucumber powdery mildew in greenhouses. Phytopath. 18: 847-860. 1928.

MUSKMELON

BACTERIAL WILT, BACILLUS TRACHEIPHILUS EFS.

Traces of bacterial wilt were reported from Massachusetts, New Jersey, Virginia, West Virginia, Louisiana, Ohio, Indiana, Wisconsin, Missouri, Kansas, Colorado, and Oregon. Maryland reported 0.5 per cent loss; Virginia,

7 per cent; and Ohio, 1 per cent. Iowa-- Wilt is less severe than normal due to favorable weather for host before beetles came in abundance. Loss for the season 2 per cent (Porter). Missouri - rather sever in home gardens, commercial plantings relatively free (Scott).

LEAF BLIGHT, MACROSPORIUM CUCUMERINUM ELL. & EV.

In addition to the reports noted in the table, leaf blight was reported as severe without estimate of losses from New Jersey, North Carolina, Florida, and Indiana. Adams (Delaware) reported that it failed to develop as usua. Jehle (Maryland) reported that spraying and dusting prevented greater losses. Porter (Iowa) reported the first severe occurrence of the disease in that state.

Table 24. Percentage losses from muskmelon leaf blight as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
25	Georgia	2	Iowa
10	Texas	Trace	Massachusetts, New York,
8	Maryland		Delaware, North Carolina,
2-5	Michigan		Arkansas, Wisconsin,
			Colorado

Recent literature: Pl. Dis. Reptr. 12: 37, 70.

ANTHRACNOSE, COLLETOTRICHUM LAGENARIUM (PASS.) ELL. & HALS.

Severe infections of anthracnose were reported from Kansas and Iowa with 10 and 8 per cent loss respectively. Traces of the disease were found in New York, New Jersey, West Virginia, North Carolina, Florida, Arkansas, Ohio, and Wisconsin. A note on effectiveness of spraying was contributed by Porter (Iowa) showing that Bordeaux reduced losses from 50 to 15 per cent on plots where cantaloupes had been grown for four consecutive years.

Recent literature: Pl. Dis. Reptr. 12: 76.

DOWNY MILDEW, PSEUDOPERONOSPORA CUBENSIS (BERK. & CURT.) ROSTEW.

Traces of downy mildew on cantaloupe were reported from Delaware, Virginia, West Virginia, Georgia, Florida, Texas, Iowa, and Missouri. Adams (Delaware) reported the first heavy attack in three years, the disease appearing following the peak of the harvest. McWhorter (Virginia) reported a late attack and estimated a 3 per cent loss. Boyd (Georgia) reported that the disease appeared in epidemic form too late in the season to be of much consequence on cantaloupes, but estimated 1 per cent loss. Weber (Florida) reported that this was the most serious disease of the host in the state. Porter (Iowa) reported that it was found for the first time in that state.

Recent literature: Pl. Dis. Reptr. 12: 110.

MOSAIC (VIRUS)

Milbrath (California) reported 100 acres in the Imperial Valley a complete loss from mosaic and Chupp (New York) reported a 5 per cent loss for the state from the opposite end of the country. Traces to 1 per cent were reported from Massachusetts, New Jersey, Maryland, Virginia, Ohio, Wisconsin, Iowa, Kansas, and Oregon. Contributions concerning the hosts other than cucurbits are very desirable.

Recent literature: Pl. Dis. Reptr. 12: 76.

POWDERY MILDEW, ERYSIPHE CICHORACEARUM DC.

A 12 per cent loss was reported by Boyd from Georgia where the disease was more destructive in some fields than leaf blight. A 25 per cent loss was the maximum for any field. This disease was also reported as abundant in Florida but doing little damage, and causing about 2 per cent loss in Texas. The first occurrence of the disease in Iowa was noted by Porter. In the Imperial Valley of California, it was widely distributed but held in check by dusting; loss 3 per cent. (Milbrath).

The following observations were made at the Market Garden Field Station at Waltham, Massachusetts, August 1928 and reported by Guba:

Cucumis melo chito (vine peach)	susceptible
C. melo culta (cantaloupe)	"
C. sativus (lemon cucumber)	"

Muskmelon - Powdery Mildew

C. anguria (gherkin)	resistant
Sicyos angulatus (star cucumber)	"
Echinocystis lobata (mock-cucumber)	"

Recent literature: Pl. Dis. Reptr. 12: 65, 70, 146.

1. Guba, E. F. Significant practices in the control of diseases of greenhouse cucumbers and tomatoes. Amer. Prod. Grow. 3(9): 7, 15. Sept. 1928.

2. Harrigan, B. A. Cantaloupe mildew in Imperial Valley. California Dept. Agr. Mo. Bul. 17 (8): 473-474. Aug. 1928.

OTHER DISEASES

Bacterium lachrymans EFS. & M. K. Bryan, angular leaf spot. In Iowa from one location only.

Caconema radicicola (Greef) Cobb, root knot. Eight per cent loss reported from Georgia.

Fusarium niveum EFS., wilt. Three per cent in Missouri and a trace in Pima and Maricopa Counties, Arizona.

Sclerotium sp., rolfsii or delphinii. Arkansas - a severe epidemic has appeared in the region around Hope and Ft. Smith largely in the form of a soft mushy rot of fruit. (Rosen). Virginia - a two-acre field near Norfolk following infected eggplants and carrots showed 100 per cent infection occurring as a fruit rot. H. H. Whetzel has identified the fungus as Sclerotium delphinii (McWhorter). Texas - prevalent, 1 per cent loss.

Curly top (virus) - Reported in 1928 only from Oregon, but literature has contained some references to this disease on cantaloupes as well as other hosts.

Leaf spot (undet.) - Reported by Boyd (Georgia) as scattered infections.

Ring spot (virus) - West Virginia, determination verified by S. A. Wingard.

Recent literature: Pl. Dis. Reptr. 12: 37, 64-65, 69, 75.

1. Drechsler, Charles. A fruit rot of honey dew melons due to a species of Phytophthora. (Abstract) Phytopath. 19: 85. Jan. 1929.

2. McKay, M. B. The curly top disease. Seed World 23 (13): 38, 40, 72. June 29, 1928.

3. Severin, H. H. P., and C. F. Henderson. Some host plants of curly top. Hilgardia 3: 339-392. June 1928.

PUMPKIN

Cercospora cucurbitae Ell. & Ev., leaf spot. Virginia.

Erysiphe cichoracearum DC., powdery mildew. Maine. Traces in West Virginia, and Colorado.

Curly top (virus). Oregon.

Ring spot (virus). West Virginia, one case only.

Recent literature: Pl. Dis. Reptr. 12: 109-110.

SQUASH

Curly top (sugar beet virus). B. L. Richards reported as follows concerning this disease (February 11, 1929).

"Curly top on the squash, was found during August and early September, 1928, in Cache, Boxelder, Davis, and Salt Lake Counties. The disease was especially severe in the Hunter and Magna districts of Salt Lake County. Of the 11 fields visited in this period, eight showed the disease in a severe form. An average of 38.1 per cent of the plants in these fields were affected at the time of the survey. In one field of the Hubbard variety, 91 (88.5 per cent) of the 102 plants which had survived bacterial wilt exhibited the disease. Many of these plants had spread less than three feet and none severely affected had set fruit. The degree of severity in Hunter and Magna districts, however, cannot be taken as an indexto the damage caused by curly top in Utah. Curly top of sugar beets, tomatoes, and squash, is usually more severe in these areas than most other parts of the State. The nearness to native desert vegetation and absence of barriers to the migration of the Eutettix tenellus probably accounts for this fact. Linford (P.D.R. Supplement 59:100) states 'that the disease in 1927 varied from a trace up to a maximum infection of 12 per cent; in the state as a whole it causes less than 1 per cent loss.'"

Squash - Wilt

Wilt (possibly bacterial in nature.) This disease was reported from Utah again by B. L. Richards (February 4, 1929) as follows:

"Linford (Pl. Dis. Reptr. 59:100) reports this disease as usually associated with the squash bug in Salt Lake, Davis, and Weber. In addition, during 1928 the writer observed the trouble in Boxelder and Cache counties. To the writer's knowledge, this is the first time the disease has been reported from the latter county. Of the 11 fields studies in Hunter and Magna districts during September, 1928, but one field was found free from the wilt. Of the ten infested fields, two showed 100 per cent infection; four more than 50 per cent; five between 25 per cent and 50 per cent; and but a single field less than 25 per cent. An average of 56.2 per cent of the plants in the ten diseased fields showed wilt. It is evident that this percentage would indicate a loss far below the actual loss at harvest time as the disease was spreading rapidly at the time these data were taken.

"In previous years the disease has been so severe in Davis, Weber, and Boxelder counties that growers have practically ceased planting the crop. Wilt has not only become a limiting factor in squash production in certain local areas, but seriously threatens the entire industry in the state. It is by far the most important disease affecting the squash in Utah. In Cache County the disease as in most cases where it has been observed in Utah, was found constantly associated with the squash bug (Anasatristis) and possibly functions as a carrier of the casual factor.

"A number of facts justify the assumption that this particular disease is not the same as the wilt caused by Bacillus tracheiphillus. Wilt has not been found in Utah on the cucumber, cantaloupe or muskmellon, the three most susceptible plants to Bacillus tracheiphillus. Neither have the two principal carriers of Bacillus tracheiphillus, the striped cucumber beetle or the twelve spotted cucumber beetle, been located in the districts in which the Utah type of wilt is so prevalent."

Recent literature: Pl. Dis. Reptr. 12: 96, 126.

Phymatotrichum omnivorum (Shear) Duggar, cotton root rot. Texas, one case on yellow crookneck.

Bacillus tracheiphillus EFS., bacterial wilt. New Jersey.

Erysiphe cichoracearum DC., powdery mildew. New Jersey, Texas.

Fusarium sp., wilt. Texas, prevalent.

Pseudoperonospora cubensis (Berk. & Curt.) Rostew., downy mildew. Texas.

Sclerotinia sclerotiorum (Lib.) Mass., rot. Maine.

Mosaic (virus). New Jersey, Texas, Montana.

Curly top (virus). New Mexico, Oregon.

Recent literature

1. Bryan, M. K. Squash of Hubbard variety attacked by new leaf spot. U. S. Dept. Agr. Yearbook 1927: 599-600. 1928.

W A T E R M E L O N

ANTHRACNOSE, COLLETOTRICHUM LAGENARIUM (PASS.) ELL. & HALS.

An examination of the figures in the table will show that anthracnose was severe in widely separated states. In the case of Delaware, Georgia, Florida, Iowa, Missouri, and Kansas the disease was said to be more prevalent than usual. In Delaware the injury was principally to the fruit. In Georgia field infections were most prevalent on leaves but heavy infection developed in transit causing one-third of the total loss given. All varieties were reported susceptible. In New Mexico the disease was prevalent and Bordeaux gave good control if applied soon enough but in the absence of control measures whole fields were destroyed overnight (Crawford).

Table 25. Percentage losses from watermelon anthracnose as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
30	Georgia, Kansas	5	West Virginia
11	Iowa	1	Missouri
8	Maryland	Trace	Virginia, New Jersey, Tennessee

Recent literature: Pl. Dis. Reptr. 12: 24, 37, 70, 76, 95, 119.

WILT, FUSARIUM NIVEUM EFS.

Wilt in watermelons as seen in the loss table below was serious in widely separated sections of the country. It appears to have been fully as important as anthracnose. Many collaborators reported it as serious except on new land. Resistant variety work was reported in the literature for the year.

Watermelon - Wilt

Table 26. Percentage losses from wilt of watermelons as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
50	Iowa	3	Texas
10	West Virginia, Missouri	2	Georgia
		1	Kansas

Recent literature: Pl. Dis. Reptr. 12: 24, 37, 66, 95.

1. Porter, D. R. Infection studies with watermelon wilt caused by Fusarium niveum EFS. Iowa Agr. Exp. Sta. Res. Bul. 112: 347-368. May 1928.

2. _____ and I. E. Melhus. Further studies on watermelon wilt in Iowa. (Abstract) Phytopath. 19: 84. Jan. 1929.

OTHER DISEASES

Bacillus tracheiphilus EFS., bacterial wilt. Traces reported from Maryland, Virginia and Colorado.

Caconema radicicola (Greef) Cobb, root knot. Georgia - less prevalent than usual but causing 4 per cent loss.(Boyd). Mississippi, Texas, Arizona.

Cercospora citrullina Cke, leaf spot. Georgia, more prevalant than usual causing slight to complete defoliation of individual plants and accounting for a .5 per cent loss. Mississippi, Texas.

Diplodia sp., blossom end rot. Georgia, on poorly developed fruits; Texas.

Macrosporium cucumerinum Ell. & Ev., leaf blight. Common in Georgia and New Mexico.

Mycosphaerella citrullina (C. O. Smith) Gross., gummy stem blight. Florida, not as common or prevalent as in 1927. Georgia, general in distribution, causing loss especially as leaf spot on all varieties amounting to 5 per cent loss for the state (Boyd).

Pseudoperonospora cubensis (Berk. & Curt.) Rostew., downy mildew. Georgia, became epidemic at end of season, burning foliage in earliest sections and leading to defoliation, reduction in size, and sunburning of fruit in later section; 1 per cent loss for state (Boyd).

Watermelon - Other Diseases

Pythium sp., blossom end rot. Georgia and New Mexico on poorly developed fruits.

Rhizoctonia sp., blight. Georgia, attacking leaves and runners causing defoliation; Texas.

Sclerotium rolfsii Sacc., stem rot. Georgia, causing 3 per cent loss in transit.

Sclerotium sp., blossom end rot. Georgia, on poorly developed fruits.

Curly top (virus). Serious in Oregon (McKay).

Fruit pimple, non-parasitic. Georgia, an excrescence or outgrowth from rind of melons of different ages in form of a pimple often cracking open; found in few fields (Boyd).

Lightning injury. Georgia, one spot seen.

Mosaic-like diseases. Georgia, Texas (not proved to be transmissible).

Recent literature: Pl. Dis. Reptr. 12: 24, 37, 67, 70, 76, 95,

1. Gilbert, W. W., and F. C. Meier. Chemical injury to watermelons in transit -- results of shipping tests. (Abstract) Phytopath. 19: 84. Jan. 1929.

DISEASES OF CELERY

LATE BLIGHT, SEPTORIA APII ROSTR.

Late blight was found in a number of states, see table 27, but was limited in seriousness in most cases. Heavy losses were reported from Massachusetts where early varieties suffered the heaviest losses but late varieties were also severely attacked. In New York it started seriously but became less so as the season progressed. In Virginia, where they are trying to introduce the crop this disease is a menace. Ohio reported general occurrence but light losses. Heaviest losses were reported from Michigan where 40 to 50 per cent of the late crop in the Kalamazoo, Muskegon, and two other crop districts was destroyed. The early crop was nearly disease-free in that state. Milbrath (California) reported the disease localized in the southern part of the state.

Celery - Late Blight

Table 27. Percentage losses from late blight of celery as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
50-60	Michigan (late crop)	Trace	Maine, Pennsylvania,
5	Massachusetts, New York, California (southern)		New Jersey, West Virginia, Florida, Colorado, Wisconsin,
1	Iowa		Montana, Utah, Idaho,
0.5	Ohio		Tennessee, Indiana, Minnesota, North Dakota

Recent literature: Pl. Dis. Reptr. 12: 108, 119, 134.

1. Coons, G. H., Ray Nelson and E. A. Walker. Celery blight control measures compared. Dusting and spraying tested in Kalamazoo experiments. Michigan Agr. Exp. Sta. Quart. Bul. 10: 172-175. May 1928.

2. Wilson, J. D. Celery dusting in 1927. Ohio Sta. Bimo. Bul. 13 (3): 122-124. 1928.

EARLY BLIGHT, CERCOSPORA APII FRES.

Early blight was reported as serious in Massachusetts; 10 per cent loss in Florida and Iowa; 1 per cent loss in New Mexico, and 0.5 per cent loss in Ohio. Traces in New York, New Jersey, Delaware, Pennsylvania, West Virginia, Tennessee, Texas, Wisconsin, Minnesota, Colorado.

Recent literature: Pl. Dis. Reptr. 12: 106, 134.

1. Dye, H. W. Control of celery blight. Fruit Grow. Fruiterer & Mark. Gard. 66: 191-192. Aug. 16, 1928.

2. Wilson, J. D. Celery dusting in 1927. Ohio Sta. Bimo. Bul. 13 (3): 122-124. 1928.

OTHER DISEASES

Bacillus carotovorus Jones, heart rot or soft rot. Prevalent in Massachusetts, New York, and Minnesota.

Celery - Other Diseases

Bacterium apii Jagger, bacterial blight. Traces in Ohio and New York.

Caconema radicicola (Greef) Cobb, root knot. Ohio, New Mexico.

Fusarium sp., yellows. Reported from Michigan as more serious than at any time since 1921. Especially serious on yellow kinds while green varieties appear resistant (Nelson). In Ohio, 1 per cent loss was estimated and as high as 25 per cent loss was observed in one field. Traces in Minnesota and New York.

Sclerotinia sclerotiorum (Lib.) Mass., pink rot. Florida and New York.

Black heart, non-parasitic. Reported from Wisconsin on clay soil.

Recent literature: Pl. Dis. Reptr. 12: 108, 135.

1. Coons, G. H., R. Nelson, and E. A. Walker. Celery blight control measures compared. Dusting and spraying tested in Kalamazoo experiments. Michigan Agr. Exp. Sta. Quart. Bul. 10: 172-175. May 1928.

2. Helm, A. Der Sellerieschorf. (Celery scab). Gartenwelt 32 (4): 50. 1928. (Abs. Rev. Appl. Myc. 7: 421. June 1928.)

3. Schenk, P. J. Bladvlekkenziekte van de selderie. Floralia 49: 154-155. Mar. 9, 1928.

4. Wilson, J. D. Celery spraying and dusting. Proc. Ohio Veg. Grow. Assoc. 13: 92-102. 1928.

DISEASES OF LETTUCE

Botrytis spp., gray mold rot. Also known as side rot, stem girdle, Botrytis rot, etc. Two per cent loss from "Botrytis rot" and trace of "stem girdle" reported from New York and locally severe cases in Pennsylvania; also local occurrence in New Jersey and western Washington.

Bacterium viridilividum N. A. Brown, rot. New York, trace.

Bremia lactucae E. Regel, downy mildew. Massachusetts, Common on outdoor lettuce and now rather common on Belmont variety under glass (Guba, November 15). Traces also reported from New York, Indiana, Wisconsin, Texas, Arizona, Washington, and California.

Caconema radicicola (Greef) Cobb, root knot. Reported from two localities in New York on outdoor lettuce.

Lettuce

Corticium vagum Berk. & Curt., bottom rot. A 12 to 15 per cent loss occurred in New York State. Sanitary measures consisting of gathering and destruction of all refuse as soon as crop was harvested and control of weeds along margins of field and ditches increased the yield as much as 500 crates per acre (Chupp). Texas.

Marssonina panattoniana (Berl.) Magn., anthracnose. Reported from Texas and western Washington, and a specimen was sent in from Missouri.

Septoria lactucae Pass., leaf spot. Reported for first time from West Virginia on older leaves (Archer); Wisconsin, quite prevalent in scattered locations on New York and Wonderful types (Vaughan). Also occurred in New Jersey.

Sclerotinia spp., drop. New York, 1 per cent loss. California, general occurrence with considerable damage. Trace in New Jersey and Indiana.

Brown blight (undet.). Reported from Arizona where it is said by Streets to cause serious losses where lettuce is grown continuously on the same land. In the Imperial Valley of California resistant strains are being developed by Jagger.

Mosaic (virus). Reported as present in Montana and as causing 1 to 2 per cent loss in New York. According to A. C. Foster (2), it is present in all the western lettuce growing sections. Since the disease is considered to be seed borne its presence in seed growing sections may become an important factor affecting control. Trace in New Jersey.

Pythium root rot, Pythium sp. Reported only as a trace from New York where a maximum infection of 10 per cent has been seen.

Rust (aecial stage, species undetermined). Noticed June 20 - July 4 at Madison (Vaughan).

Slimy soft rot (bacterial). Commonly associated with tipburn probably found to a greater or less extent wherever lettuce is grown. It was reported from South Carolina, Texas, Arizona, Montana, and Washington.

Tipburn (non-parasitic). New York, 1 to 2 per cent loss. South Carolina, one report only. Arizona, July 1 heavy losses in various sections where tipburn and slimy root rot ruined 50 to 90 per cent of the crop in some sections (Streets). Scattered occurrence in New Jersey.

Yellows or rabbit's ear (virus). New York, seven per cent loss for state. Pennsylvania, general occurrence with 35 per cent loss (Beach). Texas, traces in the Rio Grande Valley. Found by Kunkel (3) to be caused by the same virus as causes aster yellows.

Lettuce

Recent literature: Pl. Dis. Reptr. 12: 65, 146.

1. Connor, S. D., and C. T. Gregory. Excess soluble salts as the cause of vegetable diseases in greenhouses. Proc. Indiana Acad. Sci. 37: 385-390. 1928.

2. Foster, A.C. The V & F Pathologist 1 (9): 36. Apr. 16, 1928.

3. Kunkel, L. O. Flor. Rev. '62 (1608): 35-36. Sept. 20, 1928.

4. Weber, G. F. Diseases of lettuce, romaine, escarole, and endive. Florida Agr. Exp. Sta. Bul 195: 303-333. Apr.1928.

DISEASES OF PEAS

See report of M. B. Linford on pea diseases in the United States in 1928. (Pl. Dis. Reptr. Suppl. 67: 1-14. Mar. 15, 1929.)

Recent literature: Pl. Dis. Reptr. 12: 23-24, 37, 54, 71, 119.

1. Haenseler, C. M. Effect of organic mercury seed treatments on germination and yield of peas. Ann. Rept. New Jersey Agr. Exp. Sta. 48: 232-238. 1928.

2. Jorgensen, C. A. Gulspidssygen. Dens Udbredelse, Aarsager og Bekaempelse. (Yellow tip disease. Its distribution, causes, and control.) Tidsskr. for Planteavl. 34 (1): 76-116. 1928.

3. Linford, M. B. A Fusarium wilt of peas in Wisconsin. Wisconsin Agr. Exp. Sta. Res. Bul. 85. 44 p. June, 1928.

4. Togashi, K. Three Fusaria which cause the wilt disease of pea. Japanese Jour. Bot. 4: 153-188. Oct. 1928.

5. _____, and E. Tsukamoto. On the three species of Fusarium which cause the wilt disease of pea (Preliminary report II). Jour. Soc. Agr. & For. Sapporo, Japan 19: 409-419. Mar.1928.

DISEASES OF

MISCELLANEOUS VEGETABLE CROPS

ASPARAGUS

Puccinia Asparagi DC., rust. Traces of rust were reported from New Jersey, Virginia, Texas, Minnesota, Michigan, Iowa, North Dakota, Colorado, and Arizona, and a 2 per cent loss was estimated in Maryland. The general use of the Washington resistant selections was noted in many states as responsible for the relatively small amount of the disease although in Michigan rust resistant strains showed some disease.

Cercospora asparagi Sacc., leaf spot. Texas, common in lower Rio Grande Valley on stems and leaves, 0.1 per cent loss.

Recent literature:

1. Jones, H. A., and Robbins, W. W. The asparagus industry in California. California Agr. Exp. Sta. Bull. 446. 105 p. Jan. 1928.

BEETS (GARDEN)

Actinomyces acabies (Thax.) Gues. Scab. New Jersey, Texas.

Bacterium tumefaciens EFS. & Town., crowngall. New Jersey.

Cercospora beticola Sacc., leafspot. Traces in New York, New Jersey, West Virginia, Texas, Colorado, and 2 per cent loss in Kansas.

Curly top (virus). Twenty per cent loss was reported from Arizona. Washington.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas.

CARROTS

Alternaria radicina Meier, Drechs. and Eddy, black rot. New York, 3 to 5 per cent loss.

Bacillus carotovorus Jones, soft rot. New York, 2 to 3 per cent loss, Texas, New Mexico.

Other Crops - Diseases

Caconema radicicola (Greef) Cobb, root rot. New York, Kansas and New Mexico.

Cercospora apii carotae Pass., leaf spot. New York and New Jersey.

Cuscuta arvensis Bey., dodder. Mississippi.

Macrosporium carotae Ell and Langl., leaf blight. New Jersey, Ohio, West Virginia, and Massachusetts.

Peronospora effusa (Grev.) Ces., downy mildew. Indiana.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas.

Rhizoctonia sp., rot. New York.

Sclerotinia sclerotiorum (Lib.) Mass., rot. New York.

Yellows (undet.). New York.

Recent literature: Pl. Dis. Reptr. 12: 110.

EGGPLANT

Alternaria solani (Ell. & Mart.) Jones and Grout, leaf spot. Florida.

Bacterium solanacearum E.F.S., bacterial wilt. Florida.

Phomopsis vexans (Sacc. & Syd.) Harter, leafspot. New Jersey, trace; Florida, 10 per cent; West Virginia, on markets; Texas, common on fruit and leaves, 1 per cent loss.

Rhizoctonia solani Kuehn, damping off and ground rot. New Jersey and Florida.

Sclerotium rolfsii Sacc., stem rot. Florida.

Verticillium alboatrum Reinke and Berth., wilt. New Jersey, Massachusetts, and Pennsylvania.

Hopperburn, leaf hoppers. New Jersey, severe on Long Purple var.

Mosaic like disease. Texas.

Recent literature: Pl. Dis. Reptr. 12: 69, 119.

E N D I V E

Puccinia hieracii (Schum.) Mart., rust. California.

Rhizoctonia solani Kuehn, bottom rot. Texas.

Macrosporium sp., leaf spot. New York.

Recent literature

1. Weber, G. F., and Foster, A. C. Diseases of lettuce, romaine, escarole and endive. Florida Agr. Exp. Sta. Bull. 195: 303-333. April 1928.

G I N S E N G

Rhizoctonia spp., stem rot. Washington.

Phytophthora cactorum (Lib. & Cohn) Schroet., blight. Iowa.

Recent literature: Pl. Dis. Reptr. 12: 71.

1. Whetzel, H. H. Ramularia rust on ginseng. Spec. Crops. 27: 235-237. September 1928.

2. Whetzel, H. H., S. E. A. McCallan, and T. C. Loh. Calcium arsenate as a fungicide. (Abstract) Phytopath. 19: 83. Jan. 1929.

H O P S

Pseudoperonospora humili (Miyabe and Tak.) Wils., downy mildew. In Europe this disease has been causing much damage during the last few years and has been regarded as an introduction from some other country. This year it was reported from New York State for the first time indicating that it has but recently become established there. It was found on a Bavarian hop farm in Otsego County, New York. The mildew has recently become destructive in British Columbia, Canada.

Recent literature: Pl. Dis. Reptr. 12: 53.

1. Blattny, C. Beitrag zur Frage der Düngung des Hopfens als Mittel gegen die Hopfenperonospora (Pseudoperonospora humuli). Ernähr. Pflanz. 24: 140-142. May 1, 1928. No. 9.

2. Korff, G., and F. Zattler. Die Peronosporakrankheit des Hopfens. Arb. Bayer. Landesanst. für Pflanzenbau und Pflanzenschutz 5: 42. 1928.

3. Salmon, E. S., and Ware, W. M. Inoculation experiments with the downy mildews of the hop and nettle (Pseudoperonospora humuli (Miy. et Taka.) Wils. and P. urticae (Lib.) Salmon et Ware) Ann. Appl. Biol. 15: 352-370. Aug. 1928.

4. Salmon, E. W., and Ware, W. M. The mosaic disease of the hop; grafting experiments I - Ann. Appl. Biol. 15: 342-351. August 1928.

5. Wormald, H. The parasitism of the hop leaf-spot fungus Cercospora cantuariensis. Trans. Brit. Mycol. Soc. 13: 32-39. March 1928.

MUSHROOMS

Recent literature

1. Beach, W. S. Mushroom diseases. Pennsylvania Agr. Exp. Sta. Bul. 230. July 1928.

2. Charles, V. K., and C. H. Popenoe. Some mushroom diseases and their carriers. U. S. Dept. Agr. Circ. 27: 9 p. Feb. 1928.

OKRA

Ascochyta abelmoschi Harter, pod spot. New Jersey.

Cercospora hibisci, Tr. & Earle, leaf spot. Mississippi.

Fusarium vasinfectum, Atk, wilt. Delaware, Texas.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas.

Rhizoctonia sp., root rot. Texas.

Verticillium alboatrum, Reinke and Berth, wilt. New Jersey.

P A R S L E Y

Cercospora apii Fresen., leaf spot. New Jersey.

P A R S N I P

Cercospora apii pastinacae, Farl., leaf spot. West Virginia.

Sclerotinia sclerotiorum (Lib.) Mass., watery soft spot. Louisiana.

P E A N U T

Cercospora personata (Berk. & Curt.) Ell. & Ev., leaf spot. Florida, Georgia, Mississippi, Texas, New Mexico. Five per cent loss estimated in Georgia (Boyd).

Corticium vagum (Berk. & Curt.), stem rot. Florida.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas (very susceptible host).

Sclerotium rolfsii Sacc., stem rot. Florida, Mississippi, Texas.

Recent literature: Pl. Dis. Reptr. 12: 117.

1. Storey, H. H., and A. M. Bottomley. The rosette disease of peanuts (Arachis hypogaea L.). Ann. Appl. Biol. 15: 26-45. February 1928. No. 1.

P E P P E R

Alternaria sp., fruit rot. Ohio, Texas, New Mexico.

Bacterium solanacearum EFS., bacterial wilt. Texas.

Bacterium vesicatorium Doidge, bacterial spot. New Jersey, Delaware (common), Georgia (10 per cent loss), Florida and New York.

Botrytis cinerea Auct., gray mold. New Jersey.

Other Crops - Diseases

Caconema radicicola (Greef) Cobb., root knot. Mississippi.

Cercospora capsici Heald & Wolf., leaf spot. New York, Florida, Texas.

Colletotrichum nigrum E. & H., anthracnose. Mississippi.

Fusarium annuum Leonian, wilt. New Mexico.

Gloeosporium piperitum Ell. & Ev., anthracnose. Florida, Texas.

Phoma destructiva, Plow., rot. Delaware.

Phytophthora capsici Leonian, blight. New Jersey, and New Mexico.

Rhizoctonia sp., damping off. New Mexico.

Sclerotium rolfsii Sacc., stem rot. Florida, Georgia (5 per cent loss), Mississippi.

Blossom end rot, non-parasitic. Delaware, Georgia (2 per cent loss), Mississippi, Texas.

Leaf spot (undet.). Georgia.

Mosaic (virus). New York, New Jersey, Georgia, Florida, Mississippi, and Texas.

Sunscald. Georgia, 5 per cent loss.

Recent literature: Pl. Dis. Reptr. 12: 24, 70,76.

R H U B A R B

Ascochyta rhei E. & E., leaf spot. New Jersey and West Virginia.

Erysiphe cichoracearum DC., powdery mildew. New Jersey.

Phyllosticta straminella Bres., leaf spot, Montana.

Phymatotrichum omnivorum (Shear) Duggar, root rot. Texas.

Phytophthora spp., crown rot. Washington.

Sclerotium rolfsii Sacc., stem rot. Mississippi.

ROMAINE

Sclerotinia sclerotiorum (Lib.) Mass., soft rot. Louisiana.

Recent literature

1. Weber, G. F., and A. C. Foster. Diseases of lettuce, romaine, escarole and endive. Florida Sta. Bul. 195: 299-333. 1928.

SALSIFY

Albugo tragopogonis (DC.) Gray, white rust. New Jersey.

Alternaria sp., leaf spot. Virginia.

Sporodesmium scorzonerae Aderh. West Virginia, 2 per cent loss. Apparently first report of disease in United States (Archer).

SPINACH

Cercospora beticola Sacc., leaf spot. Texas.

Colletotrichum spinaciae Ell. & Hals., anthracnose. Texas.

Peronospora effusa (Grev.) Ces., downy mildew. Massachusetts, New York, New Jersey, Maryland, Virginia (10 per cent loss, worst disease problem in this crop), Florida, Louisiana, Texas, Wisconsin, Colorado, and Washington.

Mosaic (virus). New York, Maryland, Virginia (apparently as severe as usual but consistent use of Virginia Savoy keeps it in check), and Tennessee.

Rhizoctonia sp., root rot. New York.

Yellows (undet.). Virginia.

Recent literature

1. Gilbert, B. E., and F. T. McLean. A 'deficiency disease': the lack of available manganese in a lime-induced chlorosis. Soil Science 26: 27-31. 1928.

DISEASES OF OTHER FIELD CROPS

DISEASES OF COTTON

ROOT ROT, PHYMATOTRICHUM OMNIVORUM (SHEAR) DUGGAR

Root rot was general in occurrence over the greater part of Texas and in the valleys of Arizona and New Mexico and was noted fifty miles north of the Red River in southcentral Oklahoma. Well authenticated reports located the disease at points ranging from the eastern to the western parts of old Mexico and from 50 to 150 miles south of the United States border. Previous reports have located the disease in California across the Colorado River from Yuma and in the Palo Verde Valley. Pathologists in Texas estimated a 15 per cent loss of the total crop in that State, and those in Arizona estimated a 7 per cent loss.

Taubenhaus, Ezekiel and Killough (2) have found a definite relationship between the pH of the soil and the occurrence of root rot. In general, soils with an alkaline reaction are favorable while those with an acid reaction are unfavorable to root rot. They have demonstrated that subsoil acidity is important in this connection.

In Arizona, Streets states that the disease is serious in the valleys below the 5,000 foot level. Temperature is probably one of the factors there as well as in the northern extension of the disease since it is much less severe in the northern portion of its geographic range.

Rainfall and temperature were shown by Taubenhaus and Dana (1) to have a distinct influence on the spread of the disease.

Among the hosts for root rot are numbered many of the most important of our crop and ornamental plants. A recent publication by Taubenhaus, Dana, and Wolf (3) names some 518 species of plants susceptible to Phymatotrichum omnivorum. Of these 274 were cultivated and 244 non-cultivated.

Recent literature: Pl. Dis. Reptr. 12: 67, 118.

1. Taubenhaus, J. J., and B. F. Dana. The influence of moisture and temperature on cotton root rot. Texas Agr. Exp. Sta. Bul. 386: 1-23. 1928.

2. _____, W. N. Ezekiel, and D. T. Killough. Relation of cotton root rot and Fusarium wilt to the acidity and alkalinity of the soil. Texas Agr. Exp. Sta. Bul. 389: 1-19. 1929.

Fig. 1. Present Geographic Distribution of Root Rot,

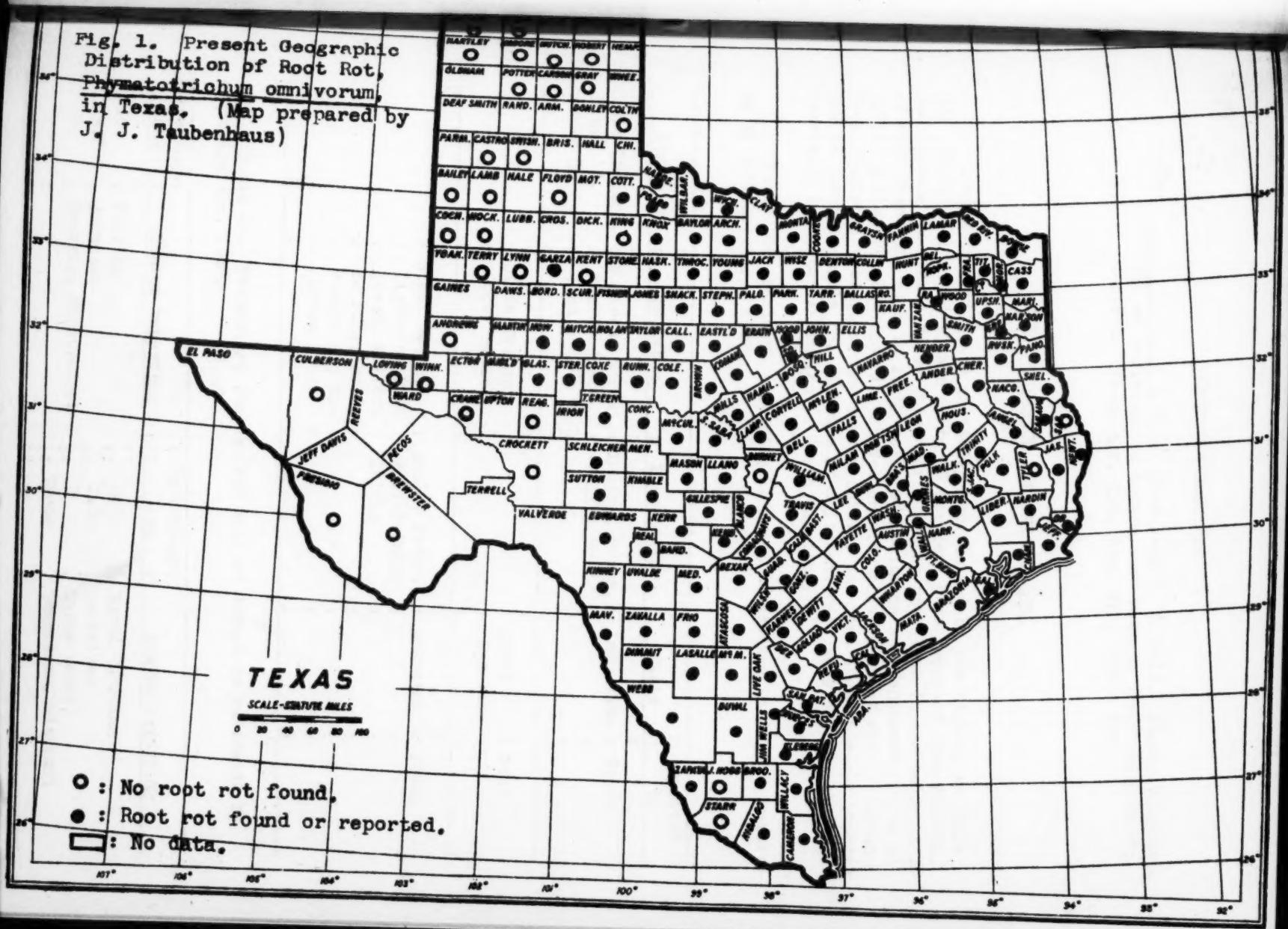

Fig. 1. Present Geographic Distribution of Root Rot, Phymatotrichum omnivorum, in Texas. (Map prepared by J. J. Taubenhaus)

3. _____, B. F. Dana, and S. E. Wolf. Plants susceptible or resistant to cotton root rot and their relation to control. Texas Agr. Exp. Sta. Bul. 393. 1929.

WILT, FUSARIUM VASINFECTUM ATK.

Losses from wilt are partially represented by the figures in table 29. Individual field losses up to 75 per cent were reported from Florida. The disease is mentioned as being particularly prevalent in the sandy soils of east Texas and also in sandy soils of Louisiana and Tennessee, while alluvial soils are mentioned in connection with occurrence of wilt in Arkansas. Varietal resistance and susceptibility was mentioned in state reports and is given in table 28. The use of wilt resistant seed was reported as receiving increased attention in North Carolina.

Table 28. Variety, susceptibility and resistance to wilt as reported by collaborators, 1928.

Immune	Resistant	Susceptible	State	Reported by
Dixie Triumph, Dixie 14, Cooke 307	Express, D&Ph. No. 4, Cleveland	Delfos, Trice, Half & Half	Louisiana	Brown
	Dixie Triumph, Super seven		North Carolina	Fant
	Super seven, Lightning Express, Miller, E& P.L., No.6, Rowder 40, Express	Acala, Trice, Half & Half, Delfos	Arkansas	Young

Table 29. Percentage losses from wilt of cotton as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
10	Florida	2.5	North Carolina
4.5	Arkansas	2.3	Louisiana
3	Georgia, Mississippi	2	Texas (east)
		Trace	Tennessee, Missouri

Cotton - Wilt

Recent literature: Pl. Dis. Reptr. 12: 67, 97, 113, 118, 132

1. Fahmy, T. The Fusarium disease of cotton (wilt) and its control. Bul. Min. Agr. Egypt. Tech. & Sci. Serv. 74. 106 p. 1928.

2. Rosen, H. R. A consideration of the pathogenicity of the cotton wilt fungus, Fusarium vasinfectum. Phytopath. 18: 419-438. May 1928.

3. Young, V. H. Cotton wilt studies I. Arkansas Agr. Exp. Sta. Bul. 226. 50 p. June 1928.

ANGULAR LEAF SPOT, BACTERIUM MALVACEARUM EFS.

Reports were received from Virginia, North Carolina, Tennessee, Georgia, Florida, Mississippi, Louisiana, Arkansas, Texas, and Arizona with estimated losses as given in table 30. During the early part of the growing season the disease assumed epidemic proportions in Texas. Continued dry weather, however, checked the trouble and reduced losses to a minimum. Boyd (Georgia) also reported severe fnfection in the Coastal Plain section with the greatest damage in the form of the dead arm stage. Streets(Arizona) found delinting with sulfuric acid controlled the disease.

Table 30. Percentage losses from angular leaf spot of cotton as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
10	Tennessee	1.0	Texas
4	Georgia	.5	Arkansas, Louisiana, Arizona
1.5	Mississippi, North Carolina, Alabama	Trace	Virginia, Florida

Recent literature: Pl. Dis. Reptr. 12: 54, 97, 118, 125, 132.

1. Blackman, V. H. Report on the sulphuric acid treatment of cotton seed. Empire Cotton Growing Review 5 (3): 240-241. 1928.

2. Findlay, W. P. K. Some conditions influencing the development of the bacterial disease of cotton (Bacterium malvacearum). Empire Cotton Grow. Rev. 5: 29-39. Jan. 1928.

3. Sibilia, C. Batteriosi del cotone. Boll. R. Staz. Patol. Veg. Roma. n.s. 8: 93-96. Jan.-Mar. 1928.

Cotton - Angular leaf Spot

4. Stoughton, R. H. The influence of environmental conditions on the development of the angular leaf spot disease of cotton. Ann. Appl. Biol. 15: 333-341. Aug. 1928.

ROOT KNOT, CACONEMA RADICICOLA (GREEF) COBB

Losses of 2 per cent were reported from Arkansas, 1 per cent from Georgia and North Carolina, and traces in Florida, Missouri, Mississippi, and Texas. In North Carolina and Arkansas root knot was mentioned as general on light soils.

Recent literature: Pl. Dis. Reptr. 12: 132.

ANTHRACNOSE, GLOMERELLA GOSSYPII (SOUTHWORTH) EDG.

Anthracnose was reported as serious in a number of Southern States as will be seen by reference to table 31. In North Carolina injury to seedlings was of greater importance than boll rot (Fant). In Georgia, it occurred as a seedling blight and was much more prevalent and injurious in the Piedmont section than in the Coastal Plains section. Varieties resistant were Dixie Triumph and Lewis 63 (Boyd). In Mississippi rainy weather favored an abundance of the disease with a 10 per cent loss (Miles). Essary (Tennessee) stated that seed treatment gave good control.

Table 31. Percentage losses from anthracnose of cotton as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
10	Mississippi, and Tennessee	2	Florida, Virginia, North Carolina
2	Georgia	1.3	Louisiana
		Trace	Missouri, Arkansas

Recent literature: Pl. Dis. Reptr. 12: 98, 125, 132.

BOLL ROTS (VARIOUS FUNGI)

Losses of 12 per cent were reported for Georgia and 10 per cent for Florida. In a special report, G. M. Armstrong, commenting on boll rots

in the Coastal Plains region of South Carolina, gave estimates of 15 to 48 per cent of the total number of bolls rotten in different areas of this section, and stated that the season was generally a wet one and that the tropical hurricane in the early fall was a factor which favored boll rots. Rhizopus boll rot following bacterial rot was common in Texas.

Angular leaf spot lesions and lesions produced by insects seem to be the avenues of entrance of most of the boll rotting fungi and bacteria.

Diplodia gossypina is reported by Walker as the cause of the most serious boll rot in Florida with Fusarium moniliforme second. Traces found in Texas.

Penicillium, Aspergillus, Alternaria, Glomerella, and Bacteria also caused rotting of bolls but were of minor importance.

Nematospora sp., was reported as causing a boll rot in the Imperial Valley of California.

Recent literature: Pl. Dis. Reptr. 12: 97-98, 125, 145-146.

STEM ROT, SORESHIN, DAMPING OFF, CORTICIUM VAGUM BERK. & CURT

Severe seedling injury was reported from North Carolina, Mississippi, Louisiana, Texas, Arkansas, New Mexico and Arizona. In Texas, Taubenhaus and Bach, and in Arizona, R. B. Streets, estimated a 2 per cent reduction in stand.

Recent literature: Pl. Dis. Reptr. 12: 37, 118.

OTHER DISEASES

Puccinia hibisciata (Schw.) Kellerm., rust. Several counties in Texas.

Ramularia areola Atk., frosty mildew. Georgia.

Hail injury. Severe in section of Hidalgo County, Texas.

Lightning injury. Mississippi. South Carolina.

Rust (non-parasitic). North Carolina, general; Georgia, 2 per cent loss; Florida, restricted to fields of low vigor and generally poor care (Walker); Louisiana, 2.3 per cent loss; no varieties immune but vigorous growing varieties appear to be somewhat resistant (Brown); Arkansas, less important; Tennessee, 5 per cent loss.

Cotton - Other Diseases

Verticillium albo-atrum, wilt. Sherbakoff (3) has given additional data concerning this disease. He finds it rather widespread along the Mississippi River on "gumbo" soils. It is characterized by shedding of the leaves and bolls, withering of leaves and tips of branches, production of new shoots from the base and a distinct discoloration of the cambium.

Wilt (undet.) Taubenhaus, Ezekiel, and Rea (4) have reported a new wilt in Texas, distinct from that caused by Fusarium vasinfectum.

Recent literature: Pl. Dis. Reptr. 12: 67, 98, 132.

1. Guilliermond, A. Recherches sur quelques ascomycètes inférieurs isolés de la stigmatomycose des graines de cotonnier. Essai sur la phylogénie des ascomycètes (cont.). Rev. Gén. Bot. 40: 606-624. Oct. 1928.

2. Neal, D. C. Cotton diseases in Mississippi and their control. Mississippi Agr. Exp. Sta. Bul. 248, 30 p. Feb. 1928.

3. Sherbakoff, C. D. Verticillium wilt of cotton. (Abstract) Phytopath. 19: 94. Jan. 1929.

4. Taubenhaus, J. J., W. N. Ezekiel, and H. E. Rea. A new cotton wilt. Phytopath. 19: 171-173. 1929.

DISEASES OF TOBACCO

WILD FIRE, BACTERIUM TABACUM WOLF & FOSTER

Wild fire occurrence and losses are given in the accompanying table. Seed bed infection was mentioned as an important factor in spread of the disease during the season. Seed bed spraying and dusting was said by Davis to have decreased the prevalence of wild fire in Massachusetts. Jehle (Maryland) also observed that spraying or dusting of seed beds was more effective if applied before the disease appeared. Beach (Pennsylvania) reported 15 per cent of the farms affected. Tisdale found the disease confined to seed beds in Florida. A report was received from T. D. Major of the occurrence of the disease in Rouville and Montcalm Counties of Quebec, Canada. Occurrences of the same or a similar disease are reported in the literature for several foreign countries.

Tobacco - Wild Fire

Table 32. Percentage losses from wild fire of tobacco as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
25	Maryland	.2	Wisconsin
15	Tennessee	Trace	New York, Pennsylvania, Virginia, Florida, Kentucky
2	Massachusetts		

Recent literature: Pl. Dis. Reptr. 12: 24, 98, 111, 112, 116.

1. Beach, W. S. Tobacco Wildfire. Pennsylvania Agr. Exp. Sta. Bul. 230. July 1928.

2. Hill, J. Ben. Migration of Bacterium tabacum through the leaf tissues of Nicotiana tabacum. (Abstract) Phytopath. 19: 97. January 1929.

3. Hopkins, J. C. F. Wildfire and angular spot of tobacco. Rhodesia Agr. Jour. 25: 139-143. Feb. 1928.

4. Kotte, W. Der Bakterienbrand des Tabaks als Samlingskrankheit. Deutsche Landw. Presse 55: 525. Sept. 8, 1928.

ANGULAR LEAFSPOT, BACTERIUM ANGULATUM FROMME & MURRAY

Angular leafspot was epidemic in Virginia causing a total loss in yield and grade estimated by Wingard to be 25 per cent. A 4 per cent loss was estimated by Henderson and Boyd for Georgia and a 5 per cent loss by Andes for Tennessee. Wet weather was mentioned as favoring severe infection in a number of states. Severe infections without estimates of actual losses were noted in reports from Pennsylvania, Maryland, North Carolina, South Carolina, Kentucky and Wisconsin. This trouble appears to be the most important disease on tobacco this season. It was also reported by Major in the Ontario and Quebec districts of Canada.

Recent literature: Pl. Dis. Reptr. 12: 24, 68, 98, 111, 112, 114, 116.

1. Valleau, W. D. Are blackfire and angular leafspot of tobacco identical? (Abstract) Phytopath. 19: 93. January 1929.

MOSAIC (VIRUS)

Loss estimated for mosaic appear in table 33. Spreading of the trouble by field operations where plants are handled was mentioned in several reports. Valleau of Kentucky reported a field with 6 per cent infection which was traced to a man smoking natural leaf which was crushed in the hands. He also stated that the practice of furnishing workers with sterile chewing tobacco and requiring thorough washing of hands with soap and water before pulling had controlled the disease. Boyd (Georgia) reported that curing tests in Thomas County indicated an 18 per cent reduction in weight for mosaic leaves and a total value loss of 55 per cent as compared with healthy leaves of the same field. James Johnson (Wisconsin) reported the apparent overwintering of mosaic in some soils. Richards reported practically 100 per cent of the plants affected in a small field in Salt Lake County, Utah. Major (Canada) reported less loss than in previous years.

Table 33. Percentage losses from mosaic of tobacco as estimated by collaborators, 1928.

Percentage loss	States reporting	Percentage loss	States reporting
15	Wisconsin	2	West Virginia, North Carolina
12	Kentucky		
5	Maryland, Tennessee	1	Virginia, Georgia.

Recent literature: Pl. Dis. Reptr. 12: 67, 68, 69, 98, 111, 112, 114, 116.

1. Dunlap, A. A. Effects of mosaic upon the chlorophyll content of tobacco. Phytopath. 18: 697-700. Aug. 1928.

2. Holmes, F. O. Local symptoms of mosaic in the leaves of some Nicotiana species. (Abstract) Phytopath. 19: 92-93. Jan. 1929.

3. Hopkins, J.C.F. Mosaic disease of tobacco. Rhodesia Agr. Jour. 25: 188-194. Feb. 1928.

4. Purdy, Helen A. Immunologic reactions with tobacco mosaic virus. Proc. Soc. Exper. Biol. and Med. 36: 702-703. 1928.

5. Purdy, Helen A. Multiplication of the virus of tobacco mosaic in detached leaves. Amer. Jour. Bot. 15: 94-99. 1928.

6. Purdy, Helen A. The improbability of tobacco mosaic transmission by slugs. Amer. Jour. Bot. 15: 100-101. 1928.

7. Valleau, W. D., and E. M. Johnson. Observations and experiments on the control of true tobacco mosaic. Kentucky Agric. Exper. Sta. Bull. 280: 145-174. 1927.

8. Vinson, C. G., and Petre, A. W. Progress in freeing the virus of mosaic disease of tobacco from accompanying solids. (Abstract) Phytopath. 19: 107-108. Jan. 1929.

BLACK ROOT ROT, THIELAVIA BASICOLA (BERK. & BR.) ZOPF.

The only serious infection for the year was reported from Wisconsin and Kentucky, in the latter state causing a 5 per cent loss. Scattered occurrence, generally in old fields, was noted in reports from Massachusetts, Indiana, Virginia, West Virginia, North Carolina and Missouri. Connecticut Round Tip and Havana No. 142 were mentioned as resistant in Florida and Wisconsin, respectively. New Burly Hybrids and air cured hybrids were mentioned as resistant in Kentucky. T. B. Major also reported this disease from the Quebec and Ontario districts. According to Archer, the report of Fusarium oxysporum nicotianae from West Virginia in Pl. Dis. Reptr. 12: 98, September 1, 1928, is in error. The fungus was Thielavia basicola and this is the first report for the State.

Recent literature: Pl. Dis. Reptr. 12: 67, 98, 112, 115.

1. Doran, W. L. Acetic acid as a soil disinfectant. Jour. Agr. Res. 36: 269-280. 1928.

2. Johnson, J. Tobacco breeding for root-rot resistance paying good returns. U. S. Dept. Agr. Yearbook. 1927: 622-625. 1928.

3. Jones, J. P. Influence of cropping systems on root-rots of tobacco. Jour. Amer. Soc. Agron. 20: 679-685. July 1928.

OTHER DISEASES

Alternaria sp., leafspot. Loss of 7 per cent in Georgia and trace in Florida.

Bacterium solanacearum EFS. Bacterial wilt, also known as Granville wilt from its prevalence on soils of the Granville series. Reported from Virginia, North Carolina and Georgia.

Tobacco - Other Diseases

Caconema radicicola (Greef) Cobb, root knot. Fifteen per cent loss in Georgia and trace in Florida.

Cercospora nicotianae Ell. & Ev., frog-eye. Trace in Florida and North Carolina and loss of 8 per cent in Georgia.

Corticium vagum Berk. & Curt., soreshin. West Virginia, Georgia, and Tennessee. Also in Kent County, Ontario, Canada.

Fusarium affine Fautr. & Lamb., leafspot. Kentucky, in plant beds.

Fusarium oxysporum nicotianae Johnson, wilt. Traces only in Maryland.

Phytophthora nicotianae (Speg.) Van Breda de Haan, black shank. Trace in Georgia and 5 per cent loss in Florida.

Brown root rot (undet.) Reported from Massachusetts, Kentucky and Wisconsin. The effect of the preceding crop is important. In Massachusetts it appeared following timothy, in Kentucky following sod. This was was said by James Johnson to be one of the most important troubles of tobacco in Wisconsin.

Frenching, non-par. Reported from Maryland, Georgia, Kentucky, and Canada. Lime was said to aggravate the disease while side application of quickly available nitrate fertilizer corrected the condition.

Ring spot (virus). Traces were reported from New York, Maryland, West Virginia, Virginia, North Carolina and Georgia.

Sand drown, non-par. North Carolina.

Storm injury. Caused 20 per cent loss in Maryland (Jehle).

Recent literature: Pl. Dis. Reptr. 12: 65, 67, 68, 69, 70, 98, 111, 112, 114. 115, 116.

1. Ashby, S. F. The oospores of Phytophthora nicotianae Br. de Haan, with notes on the taxonomy of P. parasitica Dastur. Trans. Brit. Mycol. Soc. 13: 86-95. Mar. 1928.

2. Doran, W. L. The growth of tobacco and brown root rot of tobacco as affected by timothy infusions of different ages. Jour. Agr. Res. 36: 281-287. 1928.

3. Hopkins, J. C. F. Frenching of tobacco. Rhodesia Agr. Jour. 25: 588-591. May 1928.

4. Miller, L. P. Manganese deficiency in sand culture. American Fertilizer 68(7): 21-22. 1928.

5. Nolla, J. A. B. The black-shank of tobacco in Porto Rico. (Abstract) Phytopath. 19: 93-94. January 1929.

6. Priode, C. N. Further studies in the ring-spot disease of tobacco. Amer. Jour. Bot. 15: 88-93. Jan. 1928.

7. Tisdale, W. B. Progress in the control of black shank of tobacco through disease resistance. (Abstract) Phytopath. 19: 93. January 1929.

8. Tisdale, W. B. A disease of tobacco seedlings caused by Septomyxaaffinis (Sherb) Wr. (Abstract) Phytopath. 19: 90. Jan. 1929.

9. Valleau, W. D., and Johnson, E. M. Tobacco frenching - nitrogen deficiency disease. Kentucky Agri. Exp. Sta. Res. Bul. 281: 179-253. 1927.

10. Wingard, S. A. Hosts and symptoms of ring spot, a virus disease of plants. Jour. Agr. Res. 37: 127-153. 1928.

DISEASES OF SUGAR CANE

MOSAIC (VIRUS)

Traces of mosaic were reported by collaborators from Georgia, Florida, and Mississippi, and 5 per cent loss from Louisiana. Some comments of interest from collaborators follow:

Georgia: Most commercial acreage is planted to resistant varieties (Boyd).

Florida: Apparently diminishing in importance (Weber).

Mississippi: One hundred per cent infection on purple, none on Cayana, 10 in fields observed (Neal, Wedgworth, and Miles).

Louisiana: There was less of disease because of increasing amounts of resistant varieties planted (Tims).

Recent literature

1. Anon. Disease control in Hawaii. Eye spot and mosaic reduced in past year by control measures. Facts about Sugar 23 (28): 657. 1928.

2. Alfaro, J. Statement on mosaic control by Senor J. Alfaro. Proc. Conf. Intern. Soc. Sugar Cane Techn. 2: 91-99. 1927.

3. Dufrenoy, J. Le vacuome des cellules de canne a sucre affectées de mosaique. Compt. Rend. Soc. Biol. Paris 99: 503-505. July 13, 1928.

4. Gouaux, C. B. Sugar cane test field work. Louisiana Agr. Exp. Sta. Bul. 202. 32 pp. 1928.

5. Hadden, F. C. Sugar cane mosaic and insects. Hawaiian Planters' Record 32 (1): 130-142. 1928.

6. Hernandez Torres, O. Control del "mosaico" o "rayos amarillas" de la cana de azucar. Rev. Agr. Com. y Trab. 10 (4): 16. Oct. 1928.

7. McClean, A. P. D. Mosaic disease of sugar cane. With special reference to its eradication in Natal. South African Sugar Jour. 12: 483, 485, 487. 489. Aug. 31, 1928.

8. McRae, W., and L. S. Subramaniam. A further note on the mosaic disease of sugar cane. Agr. Jour. India 23: 239-255. July 1928.

9. Venkatraman, T. S., and R. Thomas. A leaf adaptation conducive to mosaic resistance in the sugar cane. Agr. Jour. India 23: 56-57. Jan. 1928.

OTHER DISEASES

Bacterium sp., red stripe. Louisiana.

Bacterium sp., top rot. Louisiana.

Colletotrichum falcatum Went., red rot. Florida, Mississippi, and Louisiana (there was less of the disease because there was much less of the susceptible varieties planted) (Tims).

Helminthosporium stenospilum Drechsler, brown stripe. Louisiana, less this year because less of the susceptible varieties were planted. Not less on susceptible varieties (Tims).

Melanconium sacchari Mass., rind disease. Mississippi.

Pythium sp., root rot. Louisiana, 12 per cent loss (Tims).

Pokkah bong (undet.). Louisiana, the disease is general in P.O.J. 234, Louisiana Purple. Much less in P.O.J. 213 and 35 (Tims).

Tall multiple bud (undet.). Louisiana, P.O.J. 234, 979, 2725 susceptible (Tims).

Recent literature

(Note: In Suppl. 61: 294. 1928, the articles on eye-spot (15, 16, 17) should be credited to H. A. Lee. The correct citations are given below (11, 12, 13)).

1. Anon. The new Java P.O.J. 2878 cane. Internat. Sugar Jour. 30 (350): 61-62. 1928.

2. Anon. Disease control in Hawaii. Eye spot and mosaic reduced in past year by control measures. Facts about Sugar 23: 657. July 14, 1928.

3. Bolle, P. C. Verdere onderzoekingen over pokkah boeng en top-rot. (Further investigations on pokka boeng and top rot.) Arch. Suikerind. Nederl. Indië, I Deel 36 (6): 116-129. 1928.

4. Carpenter, C. W. Temperatures favorable to zoospore development in Pythium aphanidermatum. Hawaiian Plant. Rec. 32: 394. Oct. 1928.

5. _____ Notes on Pythium root rot IV. Hawaiian Plant Rec. 32: 461-474. Oct. 1928.

6. Ciferri, R. Preliminary observations on sugar cane mycorrhizae and their relationship to root disease. Phytopath. 18: 249-261. Mar. 1928.

7. Cook, M. T. The development of the spores of Plasmodiophora vascularum. (Abstract) Phytopath. 19: 91-92. Jan. 1929.

8. Cook, M. T. The gummosis of sugar cane. Jour. Dept. Agr. Porto Rico 12: 143-179. July 1928.

9. Drechsler, C. A species of Helminthosporium distinct from Helminthosporium sacchari, causing brown stripe of sugar cane. (Abstract) Phytopath. 18: 135-136. 1928.

10. Faris, J. A. Brown stripe of sugar cane in Cuba. (Abstract) Phytopath. 18: 135. 1928.

11. Lee, H. A. The effect of potash fertilizers on eye spot at the Waimanalo sugar company. Hawaiian Plant. Rec. 31: 284-287. July 1927.

12. _____ The susceptibility to eye spot of H 109 ratoons as compared with plant cane. Hawaiian Plant. Rec. 31: 296-299. July 1927.

13. _____ The effect of frequency of irrigation applications on eye spot at the Lihue plantation company, Ltd. Hawaiian Plant. Rec. 31: 292-296. July 1927.

14. Lee, H. A., and W. D. Pierce. Bacterial red stripe disease of sugar cane in countries of the Pacific. Phytopath. 18: 945. Nov. 1928.

15. Martin, J. P. Tests of varying amounts of nitrogen and potash in relation to eye spot during the 1927-1928 eye spot season. Hawaiian Plant. Rec. 32: 475-481. Oct. 1928.

16. _____ The control of eye spot disease by two-year cropping. Hawaiian Plant. Rec. 32: 391-394. Oct. 1928.

17. Orian, G. Le "pokkah bong" de la canna à sucre. Rev. Agr. Ile Maurice 41: 208-213. Sept.-Oct. 1928.

18. Shepherd, E. F. S. La gommose de la canne à sucre. Rev. Agr. Ile Maurice 40: 173-176. July-Aug. 1928.

19. Shepherd, E. F. S. Le "leaf scald." Rev. Agr. Ile Maurice 40: 176-178. July-Aug. 1928.

20. Stewart, G. R., and F. Hansson. Study of the effect of nematodes upon cane roots in sterilized soils. Hawaiian Plant. Rec. 32: 217-223. Apr. 1928.

21. _____, F. Muir, R. H. Van Zwaluwenburg, G. H. Cassidy, and Fred Hansson. The relation between soil treatments and nematode attacks to cane roots in central Maui soils. Hawaiian Plant. Rec. 32: 205-216. Apr. 1928.

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23. Wood, E. J. F. Cane varieties grown in Queensland, their resistance to disease. Queensl. Agr. Jour. 29: 261-270. Apr. 1928.

DISEASES OF SUGAR BEETS

CURLY TOP (VIRUS)

In Utah, curly top was epidemic, causing an estimated loss of 30 per cent. Leaf hoppers overwintered in abundance because of the favorable winter (C. M. Tompkins). In New Mexico, the crop was not attacked by curly top as in previous years (Crawford). In Oregon sugar beets are not a commercial crop and so curly top is not a problem. The disease is severe on many other crops, however (Dykstra). In Arizona a 20 per cent loss was estimated and the statement made that beet growing is being abandoned on account of this disease (Streets).

Recent literature: Pl. Dis. Reptr. 12: 119.

1. Carsner, E. Sugar-beet disease called curly top limits production. U. S. Dept. Agr. Yearbook. 1927: 603-605. 1928.

2. Carter, W. Transmission of the virus of curly-top of sugar beets through different solutions. Phytopath. 18: 675-679. Aug. 1928.

3. Knowlton, G. F. The beet leafhopper in Utah, a study of its distribution and the occurrence of curly-top. Utah Agr. Exp. Sta. Bul. 205. 23 p. June 1928.

4. McKay, M. B. The curly top disease. Seed World 23(13): 38, 40, 72. June 29, 1928.

5. Severin, H. H. P., and C. F. Henderson. Some host plants of curly top. Hilgardia 3 (13):339-392. June 1928.

6. _____, and O. Swezy. Filtration experiments on curly top of sugar beets. Phytopath. 18: 681-690. Aug. 1928.

7. _____, Transmission of tomato yellows, or curly top of the sugar beet, by Eutettix tenellus (Baker). Hilgardia 3: 251-271. May 1928.

OTHER DISEASES

Heterodera schachtii Schmidt, nematode. Utah (same as usual).

Phoma betae (Oud.) Frank, root rot and leaf spot. Massachusetts, Louisiana, Ohio, Michigan, Wisconsin, Montana, Colorado, Arizona and Utah.

Sugar Beets - Other Diseases

, Rhizoctonia sp., root rot. Wisconsin.

Cercospora beticola Sacc., leaf spot. Traces in Massachusetts, Louisiana, Texas, Ohio, Indiana, Wisconsin, Colorado, Wyoming, Arizona, and Utah, with estimated losses of 2 per cent in Kansas, 4 per cent in Ohio, 5 per cent in Michigan, and 8 per cent in Iowa.

Peronospora schachtii Fckl., downy mildew. California (not severe).

Sclerotium rolfsii Sacc., stem rot. Louisiana (30 per cent).

Uromyces betae Pers., rust. California (along coast).

Mosaic (virus). Texas, Utah.

Bacterium tumefaciens, crown gall. Texas.

Bacterium beticolum, Smith, Brown, & Town., tuberculosis or bacterial pockets. Texas.

Recent literature: Pl. Dis. Reptr. 12: 132.

1. Brown, N. A. Bacterial pocket disease of the sugar beet. Jour. Agr. Res. 37: 155-168. Aug. 1, 1928.

2. Costa, T. Contributo allo studio della "Cercospora beticola" (Sacc.) nella bassa vallata Padana. Nuovo Giorn. Bot. Ital. n.s., 35: 25-27. 1928.

3. Diffloth, P. L'assolement dans la lutte contre les parasites de la betterave. Vie Agr. et Rur. 32: 20-22. July 8, 1928.

4. Dreschler, C. The occurrence of Aphanomyces cochlioides n. sp. on sugar beets in the United States. (Abstract) Phytopath. 18: 149. 1928.

5. Ducomet, V. La cercosporiose de la betterave. Rev. Path. Veg. et Entom. Agr. 15: 110-120. April and May 1928.

6. _____ La mosaique de la betterave. Rev. Path. Veg. et Ent. Agric. 15: 24-29. 1928.

7. Esmarch, F. Die Herz- und Trockenfäule der Rüben. Kranke Pflanze 5: 161-163. Oct. 1928.

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9. McWhorter, F. P. Control of beet seedling diseases under greenhouse conditions. Virginia Truck Exper. Sta. Bul. 58: 525-544. 1927.

10. Murav'ev, V. P. Mehltau auf der Zuckerrübe. Bolezni Rast. (Morbi Plant) 16: 175-178. 1928.

11. Nuckols, S. B., and C. M. Tompkins. Delayed thinning as a means of controlling damping-off of sugar beets. (Abstract) Phytopath. 19: 95. Jan. 1929.

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14. Stewart, G., and D. W. Pittman. Predisposition of sugar-beets to late root rot. Phytopath., 18: 263-276. 1928.

15. Tompkins, C. M. Further studies on the dry-rot canker of sugar beets. (Abstract) Phytopath. 19: 94-95. Jan. 1929.

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